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Chinese restaurant employees' food allergy training needs assessment and resource creation

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Chinese restaurant employees' food allergy training needs assessment and resource creation

by

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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

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DEDICATION

For my mom, because of whom all things are possible.

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ABSTRACT

Chinese restaurants are a frequent site of food allergy incidence due to inadequate food allergy knowledge and training among foodservice employees. Research into food allergy accommodations in foodservice recommends training to address employee gaps in knowledge, however, current resources regarding food allergy are limited and need further development. Therefore, the aim of this two-part study was to explore the food allergy training needs of Chinese restaurant employees in Chicago, Illinois, and to create a food allergen reference resource of packaged foods used in Chinese restaurants as the start of a database of allergen information. Part one explored the food allergy knowledge, attitudes, practices, and previous training experiences of Chinese restaurant employees, and investigated their opinions and preferences regarding food allergy training. Ninety-eight usable questionnaires (25.4% response rate) were collected from employees of Chinese restaurants. Results found low knowledge scores (M = 7.5/12) but high attitude and practice scores; only one-third of participants had received food allergy training. Knowledge scores were found to improve with training, however, and gaps in training were identified which mirrored knowledge areas with low scores, suggesting training may not be adequately communicating necessary information. A preference for training to include printed tools for future reference was also found. Part two began the creation of a food allergy reference resource of commonly used packaged foods in Chinese restaurants. Ninety-nine items were identified from wholesale food distributor product lists and ingredient labels were collected and examined for major allergens, adherence to Food Allergen Labeling and Consumer Protection Act labeling regulations, and, the use of voluntary allergen advisories. All sample items adhered to the required federal

labeling, however, ambiguity regarding the declaration of potential allergen sources, allergen labeling formatting, and the inconsistent application of allergen advisory statements were identified as possible barriers to the accurate use and reading of ingredient labels for foodservice employees. A reference resource of commonly used packaged foods in Chinese restaurants was developed from the data. Conclusions and implications for industry and food allergy training developers are discussed.

CHAPTER 1. INTRODUCTION

Food allergies are a growing public health concern with an estimated 240-550 million people potentially suffering from food allergies worldwide (World Allergy Organization [WAO], 2013). Contact or ingestion of even small amounts of an allergen can pose a significant risk of reaction for individuals with food allergy (Sicherer & Sampson, 2018). Reactions to food allergy can result in symptoms ranging from mild, such as cramps, vomiting, hives, shortness of breath, or wheezing; to severe, such as difficulty swallowing or breathing; to death; and has resulted in 10,000 emergency department hospital visits annually (among patients under 18 years old) (Banerji et al., 2013). As there is currently no cure, medical professionals advise careful avoidance of the allergen to prevent serious health complications (Sicherer & Sampson, 2018).

Meals consumed away from home—where strict avoidance of an allergen can be more problematic—can pose a substantial health risk to individuals with food allergy. Nearly half of fatal food allergy reactions are a result of food consumed away from home, often because of foods that were thought to be safe (Ahuja & Sicherer, 2007; Ajala et al., 2010; Bailey, Albardiar, Frew & Smith, 2011; Common et al., 2013; Versluis et al., 2015). Past research has attributed allergic reactions in restaurants to communication issues, mislabeling, cross-contact during food preparation, or a lack of food allergen knowledge among foodservice professionals (Ahuja & Sicherer, 2007; Ajala et al., 2010; Bailey et al., 2011; Common et al., 2013). Yet, despite the fatal food allergy reactions and reported challenges of dining out for individuals with food allergy, there are few laws to provide oversight of food allergens accommodations in foodservice.

In 2004, the U.S. Congress passed the Food Allergen Labeling and Consumer Protection Act (FALCPA) to improve food labeling information to assist consumers in the identification of food allergens in packaged foods to prevent allergic reaction (U.S. Food & Drug Administration [FDA], 2018a). Although this provides some support for consumers with food allergy, the law extends to only packaged foods regulated by the U.S. Food and Drug Administration (FDA) and does not include foods prepared in restaurants or other foodservice operations (FDA, 2018a). In 2009, the FDA outlined recommendations for food allergy accommodations in restaurants as part of the department's Food Code, which provides federally recommended guidelines for food safety to the foodservice industry (FDA, 2018b). Problematically, as the FDA's Food Code offers only recommendations, adoption of the Code is voluntary and at the discretion of state and local governments in the creation of public health and safety laws (FDA, 2018b). More recently, the Food Safety Modernization Act (FSMA) was passed that shifted the FDA's role in food safety from reactive to proactive by requiring greater precautionary measures by manufacturers (FDA, 2018e). Food allergens are included in the legislation; however, the new mandates have little impact on the foodservice industry's food handling practices, centering instead on food manufacturing.

In the United States, formal legislation regarding food allergy remains focused on consumer products and schools (Food Allergy Research & Education [FARE], 2018a), leaving oversight or regulation of restaurants' role in food allergy safety in the hands of industry and local government. As of 2018, only six states—Illinois, Massachusetts, Maryland, Michigan, Rhode Island, Virginia—and two cities—New York City, New York, and, St. Paul, Minnesota—have passed laws specifically addressing food allergy

safety in restaurants (FARE, 2018b). Although state and local governments have begun to focus on food allergy accommodations in foodservice, the possible legal and financial repercussions (Filoon, 2016; Kronenberg, 2012) of failing to accommodate individuals with food allergy suggests that it may be in a restaurant owner and manager's best interests to take a proactive stance towards food allergy accommodation.

Asian restaurants, specifically Chinese restaurants, have been identified as frequent sites of food allergy reactions (Ahuja & Sicherer, 2007; Furlong et al., 2001). Current literature is limited regarding possible reasons as to why Asian restaurants have a greater number of reported food allergy reactions than other restaurant types, and studies suggest the reasons may be the same for food allergy incidence in foodservice overall, namely, miscommunication with staff and hidden food allergens (Common et al., 2013; Furlong et al., 2001; Kwon & Lee, 2012). In research of food safety and foodborne illness outbreaks in Asian restaurants, cross-contamination, language barriers, food safety culture, and training were found to be common food safety barriers (Mauer, Kaneene, DeArman, & Roberts, 2006; Roberts, Kwon, Shanklin, Liu, & Yen, 2011). Given the similarities and overlap between food safety and food allergy safety, it is possible the same issues increasing foodborne illness outbreaks in Asian restaurants are also affecting the rate of food allergy reaction in them.

Previous research has frequently recommended food allergy training to help minimize food allergy incidence in restaurants (Kwon & Lee, 2012; Ahuja & Sicherer, 2007; National Academies of Science, Engineering, and Medicine [NASEM] et al., 2016). However, fewer than half of foodservice employees report having received any food allergy training, with formal food allergy training being reported by less than a

quarter of foodservice employees (Ahuja & Sicherer, 2007; Bailey et al., 2011; Common et al., 2013). Despite this lack of training and demonstrable gaps in food allergy knowledge, research has found foodservice managers and food handlers report confidence in their own abilities to provide allergen safe meals (Ahuja & Sicherer, 2007; Bailey et al., 2011; Common et al., 2013), suggesting foodservice professionals are unaware of the severity of their own food allergy knowledge and training gaps.

Current options for food allergy knowledge and training are limited and need further development to better reach the varied needs of the diverse foodservice industry (NASEM et al., 2016; Sicherer et al., 2012). The lack of variety of food allergy training can pose problems for the foodservice industry's wide-ranging demographics, as demonstrated in food safety training research, where differing attitudes, levels of English literacy, language, and inadequate resources are barriers of food safety training (Mauer et al., 2006; Niode, Bruhn, & Simonne, 2011; Park, Kwak, & Chang, 2010; Roberts, Kwon, Shanklin, Liu, & Yen, 2011; Rudder, 2006).

Most state and local regulators that currently require food allergy training for foodservice professionals require the programs to be certified by the American National Standards Institute (ANSI). Among the food allergy training programs certified by ANSI, few are offered in languages other than English or provide reference and information for culturally-specific ingredients. As food allergy training in Asian restaurants may be helpful in the reduction of food allergy reaction, and Chinese restaurants have been identified as being particularly problematic sites for incidence for individuals with food allergy, providing improved training resources for foodservice employees in Chinese restaurants can be critical in the minimizing of incidences. To improve future training

programs, an assessment of current food allergy knowledge and training among foodservice employees in Chinese restaurants and the further development of food allergy literature was necessary.

Significance of Study

Little research regarding food allergy training for Asian restaurants exists despite previous research findings that indicate Asian restaurants are common sites of food allergy reactions away from home. Past research has primarily focused on assessing foodservice employees' knowledge and attitudes of food allergy or examining food allergy management practices in foodservice, such as training or operational policies (Choi & Rajagopal, 2012; Lee & Xu, 2015; Dupuis et al., 2016). Multiple studies have examined food allergy knowledge, attitudes, practices, and training of restaurant employees including, Ahuja and Sicherer (2007) and Radke et al. (2016) in the U.S., and, Bailey, Albardiar, Frew, and Smith (2011) in the United Kingdom. Lee and Xu (2015) explored restaurant manager food allergy knowledge and employee training procedures while Dupuis et al. (2016) surveyed restaurant workers in an urban area regarding their food allergy management and adverse events practices. Common et al. (2013) has explored food allergy awareness and management practice of staff in ethnic restaurants, focusing on Asian-Indian food restaurants in a city in the United Kingdom.

This study extends the literature by examining food allergy training needs for foodservice employees in Chinese restaurants, including current food allergy knowledge and training. Given the current lack of legislation regarding food allergy accommodation in restaurants, the reported gaps in food allergy knowledge, and the high proportion of food allergy reactions in restaurants being attributed to meals consumed in Asian

restaurants, it was expected that fewer than half of employees of Chinese restaurants will have received food allergy training.

Additionally, past research regarding food allergy research has reported that training resources are limited (NASEM et al., 2016; Sicherer et al., 2012). To address this need, this study created a food allergen reference resource identifying major allergens in commonly used packaged foods in Chinese restaurants to further the knowledge base of information available for future food allergy training programs for employees of Chinese restaurants.

Objectives of Study

The purpose of this study was to identify the food allergy training needs of food handlers in Chinese restaurants and to create a food allergy reference resource of packaged foods in Chinese restaurants. To fill the gap in literature, the current study assessed the food allergy knowledge, attitudes, practices, training experiences and preferences of employees in Chinese restaurants and identified information regarding ingredients specific to Chinese restaurants.

The specific objectives were to:

1. Assess food allergy knowledge and training needs of employees in Chinese restaurants,
2. Assess food allergy attitudes and practices of employees of Chinese restaurants,
3. Identify food allergy training preferences of employees in Chinese restaurants,
4. Identify 20 commonly available packaged food types in Chinese restaurants,

5. Analyze ingredient labels of commonly available packaged food items used in Chinese restaurants for major food allergens, FALCPA compliance, and use of voluntary allergen advisories, and,
6. Create a food allergen reference resource of commonly available packaged food items in Chinese restaurants.

The research questions were:

1. What are the food allergy knowledge and training needs of employees in Chinese restaurants?
2. What are the attitudes and practices of employees of Chinese restaurants towards food allergy?
3. What are the food allergy training preferences of employees in Chinese restaurants?
4. Are there differences in food allergy knowledge, attitudes, practices, training, and training needs among employees of Chinese restaurants based on previous food allergy or food safety training?
5. Are there differences in food allergy knowledge, attitudes, practices, training, and training needs based on Chinese restaurant employee demographic characteristics?
6. What are 20 commonly found packaged foods in Chinese restaurants?
7. Which of the commonly found packaged foods in Chinese restaurants contain at least one major food allergen?

Hypotheses

Based on a review of existing literature of food allergy knowledge, practices and training in restaurants, food safety in ethnic, specifically Chinese restaurants, this study proposed the following hypotheses:

H_1: Chinese restaurant employees will have low knowledge scores regarding food allergy.

H_2: Chinese restaurant employees will have not completed food allergy specific training.

H_3: Chinese restaurant employees will have a negative attitude towards food allergy accommodations in restaurants.

H_4: Chinese restaurant employees will infrequently follow safe food allergen practices.

H_5: Chinese restaurant employees will prefer training targeted to their language and workplace needs.

H_6: Commonly available Chinese ingredients are unlikely to follow FALCPA's food allergen labeling requirements.

Definition of Terms

Anaphylaxis – a severe, rapid onset allergic reaction that can result in constricted airways in the lungs, severe lowering of blood pressure and shock (referred to as anaphylactic shock), suffocation by swelling of the throat (American Academy of Allergy, Asthma & Immunology [AAAAI], 2018)

Asian restaurant – a commercial foodservice operation offering menu items using ingredients or cooking techniques that originate in an Asian country, including but not limited to countries in East Asia (e.g. China, Korea), Southeast Asia (e.g. Thailand, Vietnam), South Asia (e.g. India, Pakistan), Central Asia (e.g. Afghan, Kazakhstan), and West Asia (e.g. Turkey, Iran) (The Culinary Institute of America, 2006)

Chinese restaurant – a commercial foodservice operation offering menu items using ingredients or cooking techniques that originate from China, or serving dishes typical of

that cuisine, such as fried rice, sweet and sour pork, moo shu pork, wontons (George, 2000; National Restaurant Association, 2015)

Cross-contact – the inadvertent introduction of an allergen residue or trace amount of an allergenic food into a product that would not intentionally contain that allergen as an ingredient (FDA, 2018c)

Ethnic food – an ethnic group's or a country's cuisine that is culturally and socially accepted by consumers outside of the respective ethnic group (i.e. Greek food, Indian food in countries outside of their own) (Kwon, 2015)

Food Allergen Labeling and Consumer Protection Act (FALCPA) – an amendment to the Federal Food, Drug, and Cosmetic Act passed by Congress in 2004 that requires a food that contains a major food allergen (either ingredient or derivative) be declared on the label; the law went into effect in 2006 (FDA, 2018a)

Food away from home – foods that are purchased at both commercial and non-commercial foodservice establishments, including fast food, take-out, delivery, concession stands, buffet and cafeteria, full-service restaurants, vending machines, and mobile vendors (U.S. Department of Agriculture, 2017)

Hidden allergen – the non-obvious (not easily identifiable or recognized) presence of major food allergens in foods or processed food ingredients in dishes (Fiocchi & Fierro, 2017)

Food allergy - an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food (Fiocchi & Fierro, 2017)

Food allergen - specific components of food or ingredients within food (typically proteins) that are recognized by allergen specific immune cells and elicit specific immunologic reactions (Boyce et al., 2011)

Food allergic reaction – the symptoms that result in an individual with food allergy consuming the food to which they are allergy which can occur within minutes or hours ingestion, symptoms include: hives, flushed skin or rash, tingling or itchy sensation in the mouth, swelling of fact, tongue, lips, throat or vocal cords, abdominal cramps, vomiting and/or diarrhea, coughing, wheezing, or difficulty breathing, dizziness and/or lightheadedness, and loss of consciousness (Boyce et al., 2011)

Major food allergen – one of the eight major food allergens that account for 90% of food allergic reactions are: milk, egg, fish (including bass, flounder, cod, and crustacean shellfish such as crab, lobster, or shrimp), tree nuts (including almonds, pecans, or walnuts), wheat, peanuts, and soybeans (FDA, 2018d)

Dissertation Organization

This dissertation consists of six chapters. Chapter one, the introduction, outlines the study's objectives, hypotheses, and significance, and provides a definition of terms. Chapters two and three provide a review of relevant literature and description of the study's methods, respectively. Chapter four is a manuscript of the needs assessment portion of the study for submission to the *Journal of Foodservice Management and Education*. Chapter five is a manuscript for submission to the *Journal of Foodservice Business Research* regarding the development of a food allergen reference resource for commonly used foods in Chinese restaurants. Chapter six provides a summary of the study's findings, conclusions, and future research opportunities.

The primary investigator was responsible for development of research concept, data collection, data analysis, and manuscript writing. Dr. Rajagopal was involved in all phases of research.

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CHAPTER 2. REVIEW OF LITERATURE

Overview of Food Allergy

Food allergy is an immune-based disease (Boyce et al., 2010) that causes an inappropriate or exaggerated reaction of the immune system to a protein within a food triggering a protective response from the body (American Academy Allergy, Asthma & Immunology [AAAAI], 2018). While any food can potentially cause an adverse reaction when consumed, 90% of serious allergic reactions in the United States can be attributed to eight foods/food groups: milk, eggs, peanuts, wheat, soy, fish, crustacean shellfish, and tree nuts (U.S. Food and Drug Administration [FDA], 2017), which share protein families that account for most allergic reactions (Sicherer & Sampson, 2010).

Causes, Symptoms, and Treatment of Food Allergies

Food-induced allergic reactions can range from mild to severe to life-threatening, affecting the skin, gastrointestinal tract, cardiovascular system, and respiratory tract, including rashes, vomiting and diarrhea, weak pulse, and difficulty breathing (AAAAI, 2018). The most severe allergic reaction, anaphylaxis, impairs breathing, induces shock and can cause death without immediate medical treatment (Boyce et al., 2010; Sicherer & Sampson, 2018). Reactions vary from person to person, can be unpredictable, change over time, and develop at any age (Boyce et al., 2010).

It should be noted that food allergy is distinct from food intolerance, as food intolerance does not involve the immune system (AAAAI, 2018). Although food intolerance such as lactose intolerance and celiac disease share some symptoms with food allergy, including vomiting, diarrhea, swelling, and rashes, intolerances do not trigger anaphylaxis (Boyce et al., 2010).

Currently, there is no cure for food allergy. Early detection and careful management of the disease is critical and a strict avoidance of causal foods as the safest way to prevent reaction (Sicherer & Sampson, 2010).

Prevalence of Food Allergies

The World Allergy Organization (WAO) (2013) reports food allergies are on the rise across the globe with the severity and complexity of allergies also growing. The cause of the increase in food allergy prevalence is unknown but may be attributed to several factors, including an increase in awareness of food allergy and reporting, improvement in healthcare, regional, environmental, and genetic factors, diet, and the globalization of foods (Hadley, 2006). Evaluations of food allergy prevalence report varying figures as studies examining frequency struggle with incomplete data from medical databases, incorrect diagnoses, and varying definitions of food allergy (Boyce et al., 2010). Estimates suggest between 220-520 million people worldwide may have a food allergy (Fiocchi, Sampson, Bahna, & Lack, 2011). A systematic review of food allergy literature by Chafen et al. (2010) concluded the disease affects more than one to two percent but less than ten percent of the U.S. population.

Amongst children, Gupta et al. (2011) found eight percent had a food allergy, corresponding to an estimated 5.9 million U.S. children. Rinaldi et al. (2012) found a three-fold increase in peanut allergy diagnosis in children over a twenty-year span, while Jackson, Howie, and Akinbami (2013) found an increase 3.4% and 5.1% increase in food allergies from 1997-1999 and 2009-2011, respectively. While food allergy peaks in children and can resolve during childhood, allergies to peanut, tree nut, fish, and shellfish

are persistent, and rates of resolution have slowed, contributing to an increase in food allergy prevalence in adults (Sicherer & Sampson, 2014).

Impact of Food Allergies

Food allergy is associated with reduced quality of life for affected individuals and their families. Those with food allergy risk severe allergic reactions requiring prompt medical treatment, particularly in cases of anaphylaxis where fatality is possible (Sicherer & Sampson, 2014). Ma, Danoff, and Borish (2013) found in a review of three national databases a steady increase in anaphylaxis rates from 1999 to 2009 (approximately 2.23% per year), paralleling an increase in food allergy prevalence during the same period. Although fatalities due to food allergy are rare and occur in less than one percent of anaphylaxis cases, given the preventable and highly treatable nature of food allergy, fatality rates can be further lowered (Wang & Sampson, 2007).

Patel, Holdford, Edwards, and Carroll (2011) found 1.4 million medical encounters caused by food allergy and anaphylaxis in the U.S. and estimated the economic burden of food-induced allergic reactions and anaphylaxis for 2007 totaled an estimated $340 million of direct and indirect costs. In their analysis, Patel et al. (2011) found $225 million of direct medical costs (the cost of treatment) and calculated indirect medical costs, defined as costs from productivity losses and absences, at $115 million. Gupta et al. (2011) contend that the economic impact of food allergy is much greater, estimating that the cost for childhood food allergy alone to be $24.8 billion annually, including direct medical costs and the larger costs shouldered by families. The estimate for economic impacts of food allergy for adults and children is likely even higher.

The diagnosis is also associated with reduced quality of life for affected individuals and their families, socially and psychologically. Literature surrounding quality of life for food-allergic individuals report serious social disruption given the need for constant care to avoid allergens (de Blok et al., 2007). Individuals relay feeling their food allergy diagnosis to be considered a nuisance to others and is underestimated by others rather than thought of as a potentially serious, life-threatening illness (Bacal & Nadeau, 2013). Quality of life issues surrounding individuals affected with food allergy include feelings of social isolation or helplessness (Bacal & Nadeau, 2013; Gowland, 2001). In the case of children, past research reports 31.5% of children were bullied by classmates because of their food allergy, and 80% of children with food allergy received threats related to food by their classmates (Shemesh et al., 2013).

Food allergy may also impact an individual's health in other ways, as some overly cautious individuals anxious about severe allergic reactions may excessively restrict their diets, potentially causing nutritional deficits or compromises (de Blok et al., 2007). Given the considerable financial and social costs associated with food allergy and potential health hazards, careful and thoughtful food consumption is critical. As such, the way foods away from home are prepared and served in foodservice operations can have significant impact on the well-being of the growing number of individuals with food allergy.

Food Allergy Oversight

The FDA's Food Code provides a model of best practices for food safety in foodservice and retail establishments and since 2005 has included provisions for how commercial foodservice operations can best accommodate customers with food allergies

(FDA, 2018a). The 2013 Food Code outlines accommodations to improve food allergy safety in restaurants and retail food service, recommending the need for a person in charge that is knowledgeable about the severity of food allergy, major allergens, ingredients, labeling, and proper cleaning procedures to prevent cross-contact (FDA, 2018a). It is also the responsibility of the person in charge to ensure that food safety training of employees includes food allergy awareness (FDA, 2018a). The recommendations also detail other practices for food allergy management in foodservice, including segregating foods to reduce the potential of cross-contact, the labeling of foods using an allergen's common name to prevent mistaken use, and requiring cleaning and sanitizing of equipment and utensil contact surfaces that have touched the major allergen(s) (FDA, 2018a).

The FDA's Food Code offers a model of food safety rules and the adoption of the Food Code and determination of which version of the Food Code is at the discretion of the local and state regulatory departments. Currently, six states and two major cities have passed laws specifically addressing food allergen accommodation and management policies in restaurants (Food Allergy Research & Education [FARE], 2018). Massachusetts requires restaurants to display a food allergy awareness poster for staff, include a notice on menus and menu boards regarding food allergy self-identification, and requires at least one manager to complete an approved food allergy training program (Massachusetts Allergen Awareness Act, 2010). Rhode Island's laws follow that of Massachusetts and require a food allergy poster display, menu notices for customers, and manager training in food allergy (Rhode Island Food Allergy Awareness in Restaurants Act, 2014).

Food allergy training for managers is also required in Illinois (Illinois Food Handling Regulation Enforcement, 2017), Virginia (Virginia Department of Health, 2015), and Michigan (Michigan Food Law, 2014); while Maryland requires restaurants to prominently display a food allergy awareness poster in a staff area (Maryland Health-General, 2014), as do the local governments of New York City, New York, and St. Paul, Minnesota (FARE, 2018). Thus, while there are some state and local governments regulating food allergy management in restaurants, most still have not addressed the issue.

In 2004, the Food Allergen Labeling and Consumer Protection Act (FALCPA) was passed as an amendment to the Federal Food, Drug, and Cosmetic Act to allow for easier identification of major food allergens in foods to improve transparency of ingredient information for individuals with food allergies (FDA, 2018b). The law, which went into effect in 2006, requires domestic and imported packaged food manufacturers to label food products that contain an ingredient that is, or contains a protein from, one of the major food allergens by either emphasizing listed ingredients using common or usual names of the food or food source, or by stating the presence of an allergen using the phrase "Contains" (i.e. "Contains wheat and soy") (FDA, 2018b).

While FALCPA improves labeling information for individuals with food allergies on packaged and labeled foods, foods not regulated by the FDA, such as food products regulated by the U.S. Department of Agriculture or the Alcohol and Tobacco Tax and Trade Bureau are not included (FDA, 2018b). Additionally, foods consumed in restaurants, bakeries, food kiosks, or carry out restaurants that do not package foods are not subject the same regulations (FDA, 2018b). Thus, while FALCPA does make reading

labels easier for individuals with food allergies, allergic reactions continue to pose a threat when dining at restaurants and when relying on food handlers to prepare food safe for consumption.

In addition to FALCPA labeling, some manufacturers have chosen to include allergen advisory statements on product labels. Allergen advisory statements are voluntary and were created with the intention of increasing consumer safety and reducing any future legal problems associated with allergen ingestion (Fierro et al., 2017; Verrill & Choinière, 2009; Voordouw et al., 2012). The statements inform consumers of the possibility for trace amounts of a specific allergen to occur in the food through cross-contact during the manufacturing process (Verrill & Choinière, 2009; Voordouw et al., 2009; Voordouw, et al., 2012).

More recently, the 2011 US's FDA Food Safety Modernization Act (FSMA) was created to reform the food safety system from reactive to proactive in hopes of minimizing foodborne illnesses and its consequences by providing greater regulation of the food supply system (FDA, 2018c). While the legislation encompasses a variety of reforms for the FDA to better protect the public from food safety issues, the key changes are focused on ensuring the regulatory agency has the authority to enforce prevention-based controls against food hazards, such as requiring food safety plans, mandating inspections, and providing greater oversight of imported food safety, while also granting recall authority to ensure swift action. As the FDA classifies the major allergens as food hazards, FSMA has significant impact on how manufacturers treat food allergens moving forward.

FSMA's greatest impact on food allergens is with its requirements of preventative controls for human food safety hazards, which have introduced major shifts in how manufacturers must handle allergens. Previously optional provisions in the FDA's Current Good Manufacturing Practices (CGMPS) for food are now mandatory under FSMA, such as food safety training of all employees and the adoption of allergen cross-contact control practices and procedures. All food facilities are now required to have and implement written food safety plans that identify food safety hazards needing preventative controls and create controls that significantly minimize or otherwise prevent the hazard; the plans are also subject to approval by the FDA. As preventative controls relate specifically to food allergens, FSMA requirements include the correct labelling of allergens, as well as their appropriate monitoring, corrective actions, verifications, and record keeping, to be included in the written food safety plans. Foreign manufacturers are also required to meet the preventative controls set forth by FSMA as verified as by their importers. Importantly, FSMA regulations do not affect FALCPA labeling requirements but rather provide greater oversight and prescribe preventative contamination measures to the manufacturing process.

Food Allergy in Restaurants

Food away from home has been found to be a common source of adverse allergic reactions due to improper food handling and management in foodservice (Ahuja & Sicherer, 2007; Bailey, Albardiar, Frew, & Smith, 2011; Jarvinen, 2011, Lee & Sozen, 2016, Lee & Xu, 2015). As the share of household food expenditures on food away from home reaches new highs (43.1% in 2012 versus 39.3% in 2002), food away from home

plays an increasing role in the American diet (U.S. Department of Agriculture [USDA], 2017).

Restaurants are among the most common places where food allergy reactions occur (Jarvinen, 2011; Lee & Sozen, 2016; Lee & Xu, 2015). Wanich, Weiss, Furlong and Sicherer (2008) report 34% of food allergic individuals experienced at least one restaurant reaction with 36% of those individuals experiencing three or more reactions. In the U.S., restaurant foods accounted for nearly one in five food-induced anaphylaxis deaths between 2001 and 2006 (Bock, Munoz-Furlong, & Sampson, 2007), while in the United Kingdom, 18 of 48 food-provoked fatal anaphylaxis reactions between 1999 and 2006 occurred after eating catered food (Pumphrey & Gowland, 2007).

In many instances, the reactions occurred after consuming foods that were thought to be safe (Ahuja & Sicherer, 2007; Ajala et al., 2010; Bailey et al., 2011; Common et al., 2013). In a study to determine the prevalence of exposure to wheat by individuals with a wheat allergy or intolerance in restaurants and other foodservice establishments, Knoblaugh, McProud, Wagle, and Finkelstein (2007) found nearly half (48.5%) of participants experienced an adverse reaction due to undeclared or hidden wheat in their meal despite informing the server, communicating with kitchen staff, and using menu descriptions to express their dietary needs. In another study investigating the presence of peanuts in take-away meals from restaurants where foodservice staff were informed of an allergy, 21% tested positive for the allergic reaction inducing peanut protein, of which 9.7% contained significant amounts of peanut protein which was “almost certainly would have precipitated an anaphylactic episode” (p.82) in peanut allergic individuals (Leitch, Walker, & Davey, 2005).

Causes of Food Allergic Reactions in Restaurants

As evidenced in the literature, hidden allergens, cross-contact, staff attitudes, knowledge and training are frequently behind incidences of allergic reactions in restaurants. Hidden allergens, defined as a substance that is unrecognized or undeclared on a product label, in food presents a major hazard for individuals with food allergy and has been reported as responsible for nearly a quarter (21%) of all food allergic reactions—over 40% (41%) of which were anaphylactic reactions (Anibarro, Seoane, & Mugica, 2007), while Jarvinen (2011) found 20% of reactions to nut allergies in commercial foodservice were the result of food from buffets or food bars, or due to skin contact or inhalation of allergens from the cooking process due to air or vapors.

Kwon and Lee (2012) explored attitudes and behaviors of food allergic consumers in the U.S. towards dining out using focus group interviews. The authors found that participants (N = 17) believed the primary causes of food allergy reaction in restaurants to be cross-contact, hidden allergens, miscommunication, incomplete food information and labeling, and a lack of food allergy knowledge and training. Kwon and Lee (2012) also found hidden allergens, or otherwise non-obvious ingredients in dishes, were a major contributor to food allergic individuals concerns or allergic reactions, and participants identified cooking practices, like the use of premade sauces or flavor-enhancers, as potential sources of unknown allergens, particularly if food labels were incomplete or vague, using terms such as “spices” without specifying possible allergens present. The study’s participants further identified communication issues between front-of-house and back-of-house employees, noting that informing servers of a customers’ food allergy did not always ensure cooks received notification of the allergy and severity. Participants

concluded that a lack of training, knowledge and awareness of food allergy was likely the primary cause for restaurants failing to provide allergen-free foods (Kwon & Lee, 2012).

Attitudes of foodservice employees towards individuals with food allergies can also pose issues. When customers with food allergies self-identify to foodservice employees, responding attitudes vary significantly. Lee and Xu (2015) reported that 43% (n = 47) of restaurant operators did not believe customers reporting a food allergy to servers were truthful, while Leftwich et al. (2011) interviewed a customer with a food allergy who had been turned away from restaurants because staff could not (or would not) guarantee a safe meal and did not wish to risk the possibility of an allergic reaction. More recently, Radke et al. (2016) found employees held generally positive attitudes towards accommodating individuals with food allergies, possibly due to the change in public awareness of food allergies since Leftwich et al.'s (2011) study.

Restaurant employees are also often ill-equipped to adequately respond to the needs of those with food allergies. In a study examining the knowledge and comfort level of restaurant employees in providing food allergen safe meals, Bailey, Albardiaz, Frew and Smith (2011) found "worrying gaps" (p. 716) in staff food allergy knowledge, reporting they knew little about the severity of food allergy and safe food handling practices, such avoiding cross-contact and the careful reading of food labels for allergens (Ahuja & Sicherer, 2007; Ajala et al., 2010; Bailey et al., 2011; Sheth et al., 2010). General frustration with restaurant experiences for individuals with food allergies have left many reluctant to dine out due to fear, worry, frustration, and feelings of being a burden or being perceived as difficult (Kwon & Lee, 2012; Wanich et al., 2008). Previous research of restaurant personnel's comfort with and knowledge of providing safe meals

for individuals with food allergies concluded “at this time, the food-allergic consumer must exercise extreme caution and not assume that most restaurants are safe or that food handlers are well-versed in issues of food allergy” (p. 346, Ahuja & Sicherer, 2007). From the research, it is clear a consistent issue for foodservice employees is a lack of knowledge and training on food allergy information and practices.

Entry-level foodservice staff typically lack any formal food allergy training prior to starting in the industry, knowing little about the severity of food allergies, the need to avoid cross-contact, and the necessity of the careful reading and labelling of allergen foods (Ahuja & Sicherer, 2007; Ajala et al., 2010; Bailey et al., 2011). The lack of knowledge is rarely corrected later as foodservice employees are afforded few opportunities for food allergy education and training (Bailey et al., 2011). Indeed, many foodservice professionals report incorrect knowledge of food allergens, believing small amounts of allergens are safe, or that allergens in foods are reduced as part of the cooking process (Bailey et al., 2011). Knowledge regarding the use and understanding of allergy labels is also a known problem (Lee & Xu, 2015) as the diversity of English fluency, education, and literacy levels within the industry’s workforce alongside a lack of adequate knowledge and training surrounding food allergy among foodservice professionals further confounds the problem (Fierro et al., 2017; Vierk et al., 2007).

In a study of restaurant operators’ knowledge, awareness, training and policies towards customers with food allergies by Lee and Xu (2015), the authors found that more than 40% of participants were unable to list soy and fish as major allergens (48.2%, n = 53 and 40%, n = 44, respectively), believed that removing a food allergen from a completed dish was sufficient in preventing an allergic reaction (40%, n = 43), and more

than half (54.5%, *n* = 60) believed food allergy and food intolerance were synonymous terms. Participants (69.1%, *n* = 76) reported providing food allergy training to employees within the last year, however, the study did not report how the training was provided (Lee & Xu, 2015). The study also reported that managers had an incomplete understanding of food allergy and food allergy management only further compounding the misinformation regarding food allergies for foodservice employees (Lee & Xu, 2015). Overall, the authors found chefs to have higher food allergy knowledge scores than managers and owners of foodservice operations, and participants that received food allergy training had significantly higher knowledge scores.

In some cases, standard food safety training does not include food allergy topics, food allergy specific training is available but is typically voluntary for foodservice professionals with only a handful of states currently requiring food allergy training (Bailey, Kindratt, Smith, & Reading, 2014; FARE, 2018). Common et al. (2013) believe that the integration of food allergy training in general food safety training encourages a broader reach across foodservice employees, particularly critical in an industry with high staff turnover. However, as demand for allergen safe meals grows, targeted food allergy training for foodservice employees may be increasingly necessary (Pratten & Towers, 2004).

Despite the clear need for food allergy training by foodservice professionals, the industry's fast-paced environment, high staff turnover, language barriers, and reportedly little interest from managers and employees have stalled efforts to improve education around food allergy (Ahuja & Sicherer, 2007; Kwon & Lee, 2012; Lee & Barker, 2017; Lee & Xu, 2015). Additionally, previous research in food allergy training concluded a

lack of adequate training programs and resources for food allergy and that the currently limited resources would benefit from further development (Lee & Xu, 2015; Sicherer et al., 2012).

Food Allergy Resources for Foodservice

Of the states and local governments with food allergy legislation (currently, Massachusetts, Rhode Island, Maryland, Michigan, Illinois, Virginia, New York City, New York and St. Paul, Minnesota), only five (Illinois, Massachusetts, Michigan, Rhode Island, and Virginia) require food allergy training of a manager with nearly all requiring or recommending restaurants to prominently display food allergy awareness posters that are frequently available for free from the local boards of health (FARE, 2018). Currently, eight American National Standards Institute (ANSI)-accredited food allergy-specific training programs for foodservice professionals exist (ANSI, 2018). While other training programs may exist for foodservice professionals, state and local regulations typically require food allergy training programs to be ANSI-accredited to satisfy compliance requirements. All eight currently ANSI-accredited food allergen programs are available in English with five available in Spanish; no other languages are offered.

Board of health posters for restaurants are available in a greater variety of languages than training programs. The approved posters are often adapted from or directly sourced from FARE's food allergy awareness poster, which is also available to restaurants free of charge from the FARE website (FARE, 2018). While other sources may exist for use in restaurants, boards of health frequently link to or advocate the posters with FARE content.

There is clear need for greater diversity of food allergy training resources for the foodservice industry, yet little research has looked at developing them. Abbott, Byrd-Bredbenner, and Grasso (2007) developed a food allergy fact sheet for use in New Jersey restaurants following a new law to provide food allergy information to foodservice operators. To develop the fact sheet, Abbott, Byrd-Bredbenner and Grasso (2007) followed a five-stage development process and established a 25-person advisory panel to ensure accuracy, completeness, and appropriateness, which consisted of health professionals (i.e. registered dietitians, allergists, pediatricians, physicians, local health officers, environmental specialists), foodservice experts (i.e. restaurateurs), food allergy education experts, and food policy experts. The authors completed a review of existing literature on food allergy fact sheets, examined content and design of existing fact sheets, and conducted interviews with foodservice employees before developing and evaluating the fact sheet (Abbott, Byrd-Bredbenner, & Grasso, 2007).

In the United Kingdom, Bailey, Kindratt, Smith, and Reading (2014) developed a food allergy training for restaurant staff to address gaps in knowledge. The study's training objectives and resources were developed by a group of allergy experts, including an officer from an allergy charity, an academic clinician with interest in allergy, and a health service researcher. It was then delivered to participants from nearby restaurants with knowledge, practice, and training satisfaction assessments following the training. Results found participants saw an improvement in knowledge, change in practices changed, and were generally satisfied with the training (Bailey et al., 2014). And, while a positive change in participants' knowledge and practices was seen, the authors acknowledged that future trainings could be improved by identifying participant needs

prior to presentation or development of training to better tailor the training to the intended audience.

Chinese Restaurants in the United States

Chinese food is among the three most popular ethnic cuisines in the U.S. (NRA, 2015). The cuisine, along with Italian and Mexican foods, is often referred to as the "big three" with roughly nine in 10 consumers having tried the one of them at least once (NRA, 2015). In a study of consumers (N = 1,011) attitudes and behaviors towards ethnic foods in the U.S. by the National Restaurant Association (NRA) (NRA, 2015), 36% of consumers reported eating Chinese food frequently with 44% of consumers with children in their households getting Chinese food frequently (at least once a month). For occasional (few times a year) and frequent consumers of Chinese food, restaurants (53%) or take out or delivery from restaurants or fast food places (56%) are the most common food sources (NRA, 2015). Chinese food is the most common cuisine for restaurant takeout and delivery (NRA, 2015). Given the popularity of Chinese food amongst American consumers and the frequency with which Chinese restaurants and fast food is consumed away from home, providing safe meals for consumers with food allergy is increasingly important.

Food Allergy and Chinese Restaurants

Asian, specifically Chinese, restaurants have been identified as a common site of allergic reactions due to hidden allergens, cross-contact, and communication issues (Leftwich et al., 2011). Furlong, Maloney and Sicherer (2006) found the most common restaurant types resulting in allergic reactions to seafood (N = 182) were seafood (23%) and Asian (18%) restaurants and could be attributed to cross-contact of cooking utensils

during the cooking process and poor communication with staff and customers. In another study by Furlong, DeSimone and Sicherer (2001) of peanut and tree nut allergy reactions (N = 156) in foodservice establishments, 13% of allergic reactions in foodservice operations occurred in Asian restaurants.

Common et al. (2013) investigated Asian-Indian restaurant staff's ability to provide allergen safe foods and found gaps in staff knowledge of food allergies, despite the staff's confidence in their ability to provide a food allergy safe meal. The staff (N = 40), of which only 15% had received food allergy training, held many misconceptions of food allergy believing water could dilute allergens to safe levels (60%), cooking foods could prevent food allergy reactions (25%), and that small amounts of allergens could be safe (23%) (Common et al., 2013).

Individuals with food allergies report Chinese restaurants to be places of high risk of reaction due to the cuisine's ingredients, hidden allergens in sauces or manufactured ingredients, and fears of miscommunication between staff and customers (Kwon & Lee, 2012; Leftwich et al., 2011). In interviews with adults with nut-allergies in the United Kingdom to explore the challenges of dining out, Leftwich et al. (2011) observed that food allergic individuals specified Chinese food as problematic, with one participant explaining, "I'd love to eat in Chinese, but I don't eat in Chinese because they use so much nuts and nut oils" (p. 245). Another participant explained communication barriers with staff, "I really love… Chinese cooking, and that's always the ones that are slightly risky, particularly when you go to a Chinese restaurant where the staff are themselves trainees and there's a bit of a language barrier" (Leftwich et al., 2011, p. 246).

Difficult to identify ingredients in dishes can be particularly challenging due to some kitchen practices in Chinese restaurants, namely, "flavor-enhancing practices, such as 'blending shrimp in the dumplings or wonton' served in Chinese restaurants" (Kwon & Lee, 2012, p. 741). Additionally, Chinese restaurants' use of sauces and manufactured food ingredients make identification of food allergens complicated, as sauces usually contain multiple ingredients and manufactured ingredients may contain (or contain derivatives of) milk, egg, and soy proteins (Kwon & Lee, 2012).

Given the stress food allergic individuals feel when dining out, it is unsurprising that many will specifically avoid ethnic restaurants with foods that may be unfamiliar to them (Kwon & Lee, 2012; Leftwich et al., 2011; Pumphrey & Gowland, 2007). As ethnic foods become more commonplace in the U.S. (National Restaurant Association [NRA], 2015) avoidance of ethnic restaurants for individuals with food allergies will become increasingly difficult.

Food Allergy Resources for Chinese Restaurants

Given the scarcity of research surrounding food allergy training for foodservice it concludes that research of food allergy training for specific segments of the foodservice industry, such as ethnic restaurants, would also be scarce. This may also explain the lack of available resources currently available specific to Chinese restaurant employees.

The restaurant industry is a major employer of minorities, representing 36% of the restaurant employee workforce (Multicultural Foodservice & Hospitality Alliance [MFHA], 2017). Employees of Chinese restaurants reflect the industry's diverse workforce and are predominately Chinese and Hispanic (MFHA, 2017). Despite the large representation of minorities in the foodservice industry, few resources exist for food

allergy training in a language other than English. Of the posters available to restaurants in each of the states and cities requiring allergy awareness posters to be displayed, only four offered posters in languages other than English (Massachusetts, Maryland, Michigan, New York City), and only three in any Asian languages (Massachusetts, Michigan, New York City).

Although a diverse workforce does not assume the need for non-English language training, research into language preferences of the minority population of the U.S. suggests there is a need for greater language offerings in food allergy training. The Multicultural Foodservice & Hospitality Alliance (2017) found 59% of Asians speak a language other than English at home, with 40% of Asians describing their spoken English as less than "very well" (MFHA, 2017).

General food safety training is currently offered in languages other than English; food allergy, a component of food safety is a topic often included (albeit broadly) in generalized food safety training. Offering food allergy training in a comfortable or preferred language may promote greater understanding and acquisition of knowledge, in turn improving accommodation and safe food allergen handling practices. Thus, by extending food allergy training resources for foodservice employees in a variety of languages, food allergy knowledge and practices, like general food safety training, can also reach a larger portion of the foodservice workforce.

Additionally, despite Mexican and Italian foods popularity in the U.S. and the growing popularity of other ethnic cuisines, such as Mediterranean, sushi/sashimi, Spanish, Japanese, and Middle Eastern foods, food allergy training resources are typically focused on non-ethnic foods (NRA, 2015). The foods and ingredients found in ethnic

cuisines can be confusing for consumers and foodservice employees alike. Food safety training research has reported a need for greater culturally-sensitive and ethnically-diverse training materials and resources (Mauer et al., 2006) an issue likely mirrored in the food allergy training. Including foods and ingredients familiar to employees of a given cuisine, such as Chinese food, in training materials for food allergy can help improve knowledge for consumers and employees, reducing the risks of allergic reactions due to hidden allergens in sauces and manufactured ingredients, previously identified as a problem in Chinese restaurants (Kwon & Lee, 2012).

Given the severity of food allergy reactions and prevalence of incidence in Chinese restaurants, it is necessary to provide training programs that specifically address the needs of employees of Chinese restaurants with regards to food allergy to minimize life-threatening reactions. However, without adequate access to training programs and resources specific to foods commonly found in Chinese restaurants in the U.S., food allergy knowledge and practices of food handlers in Chinese restaurants are unlikely to improve.

Summary

This review of literature explored the severity of food allergy and the accommodation challenges individuals with food allergy face when dining out at restaurants—specifically Chinese restaurants. The literature illustrated the food allergy knowledge gaps across foodservice professionals, the need for greater training to improve knowledge and accommodation practices, and, for enhanced food allergy training programs and resources that can address the varied needs of the foodservice industry. Chinese restaurants report higher food allergy incidence rates resulting in individuals

with food allergies choosing to avoid Chinese restaurants, potentially impacting Chinese restaurant operators. As food allergy prevalence and Chinese cuisine's popularity among consumers in the United States continue to both rise, providing opportunities to ensure Chinese foodservice operators and their employees can improve accommodation of food allergic individuals is necessary. Therefore, research is needed to assess the training needs and preferences of restaurant employees in Chinese restaurants and to create a food allergy resource detailing food allergen in packaged foods found in Chinese restaurants as the start of a potential allergen database to extend the knowledge surrounding allergens in Chinese restaurants.

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CHAPTER 3. METHODOLOGY

Introduction

As explored in the review of literature, there is a need for a greater diversity of food allergy training and resources, particularly as it pertains to ethnic cuisines and the diverse workforce of the foodservice industry. Little is known as to the knowledge and training needs of foodservice employees in Chinese restaurants. To fill the gap in literature, the current study aimed to assess the knowledge and training needs of Chinese restaurant employee-specific food allergy training. Therefore, the purpose of this study was to identify the food allergy knowledge and training needs for employees in Chinese restaurants and to develop a reference resource of food allergens in packaged foods found in Chinese restaurants.

Research Objectives & Questions

The specific objectives were to:

1. Assess food allergy knowledge and training needs of employees in Chinese restaurants,
2. Assess food allergy attitudes and practices of employees of Chinese restaurants,
3. Identify food allergy training preferences of employees in Chinese restaurants,
4. Identify 20 commonly available packaged foods types in Chinese restaurants,
5. Analyze ingredient labels of commonly available packaged food items used in Chinese restaurants for major food allergens, FALCPA compliance, and use of voluntary allergen advisories, and,
6. Create a food allergen reference resource of commonly available packaged food items in Chinese restaurants.

The research questions were:

1. What are the food allergy knowledge and training needs of employees in Chinese restaurants?
2. What are the food allergy attitudes and practices of employees of Chinese restaurants?
3. What are the food allergy training preferences of employees in Chinese restaurants?
4. Are there differences in food allergy knowledge, attitudes, practices, training, and training needs among employees of Chinese restaurants based on previous food allergy or food safety training?
5. Are there differences in food allergy knowledge, attitudes, practices, training, and training needs based on Chinese restaurant employee demographic characteristics?
6. What are 20 commonly found packaged foods in Chinese restaurants?
7. Which of the commonly found packaged foods in Chinese restaurants contain at least one major food allergen?

Hypotheses

Based on a review of existing literature of food allergy knowledge, practices and training in Chinese restaurants, this study proposed the following hypotheses:

H_1: Chinese restaurant employees will have low knowledge scores regarding food allergy.

H_2: Chinese restaurant employees will have not completed food allergy specific training.

H_3: Chinese restaurant employees will have a negative attitude towards food allergy accommodations in restaurants.

H_4: Chinese restaurant employees will infrequently follow safe food allergen practices.

H_5: Chinese restaurant employees will prefer training targeted to their language and workplace needs.

H_6: Commonly available Chinese ingredients are unlikely to follow FALCPA's food allergen labeling requirements.

Use of Human Subjects

Prior to the start of research, an application detailing the intended research involving human participants was be submitted to and approved by the Iowa State University's Institutional Review Board (IRB) (Appendix A). The intended questionnaire, cover letter, and other relevant supporting documents were included in the proposal. Given the varying legal working status of employees in the leisure and hospitality industry, where unauthorized immigrants account for an estimated 18% of the industry's national workforce (Passel & Cohn, 2016), the application included a waiver of consent document that requested participants not be required to self-identify and sign informed consent forms to avoid any undue legal risks. In lieu of the consent document, participants were given a cover letter containing the elements of a consent document (Appendix B-D) without requiring a signature. Participants were able to self-select whether they kept the cover letter. Information on how the confidentiality of the collected data and of the participants would be maintained and how the data would be secured was also detailed.

Research Design

This study was be completed in two parts: needs assessment and resource creation. Part one was a needs assessment of food allergy knowledge, attitudes, practices, and training experiences and preferences of employees in Chinese restaurants. Part two

was a resource creation which furthered food allergen reference materials as it relates to foods found in Chinese restaurants by developing a database of food allergens found in foods in Chinese restaurants by identifying commonly used packaged foods in Chinese restaurants and analyzing the ingredient labels for food allergens, FALCPA compliance, and allergen advisory statements using a content analysis. Parts one and two, despite their numbering, were completed concurrently.

Part One: Needs Assessment

Population and Sample

The target population was employees of Chinese restaurants in the Chicago Metropolitan Area of Illinois. Illinois was selected for the state's change in legislation regarding food allergy training requiring all food service sanitation managers employed by a restaurant to complete American National Standards Institute (ANSI)-accredited food allergen awareness training and certification with enactment of the law on January 1, 2018 and enforcement of the law beginning July 1, 2018 (Illinois State Legislation, 2017). Given that law required ASNI-accredited food allergen awareness training for all restaurants in the state, the assessment of training resources available to the foodservice industry of Illinois seemed particularly timely.

A list of 428 self-described Chinese restaurants in metro Chicago was developed from the Chinatown Chamber of Commerce food directory of Chinatown (Chinatown Chamber of Commerce, 2013), Yelp.com, and the City of Chicago Business Affairs and Consumer Protection business license database (City of Chicago, 2018). Restaurants were deemed to be self-described Chinese restaurants and included on the list if the restaurant's name included terms referencing China such as "China", "Chinese",

"Oriental", "Chinatown", or "Mandarin", as well as regions and cities within China, such as "Hunan", "Canton" or "Guangzhou" or ""Sichuan" or "Szechuan", "Peking" or "Beijing", and "Shanghai". Data was collected during the months of April and May 2018.

Questionnaire

A questionnaire from Choi and Rajagopal (2013), originally used to investigate food allergy knowledge, attitudes, practices, and training of foodservice employees in college and university foodservice operations, was adapted for use in the current study. Using content from a review of literature and principles of survey development from Dillman, Smyth and Christian (2014), the questionnaire was adapted to suit the current study's purpose and target population. Author permission was obtained prior to use.

The final questionnaire (Appendix E-G) contained five sections. Section one investigated participant attitudes towards food allergy customers, training, and practices asking participants to indicate their agreement to 16 statements on a five-point Likert-scale, ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The second section assessed food allergy and accommodation knowledge using 12 multiple-choice questions covering food allergy reactions, major food allergens, safe food allergen handling practices, and managing reactions. Section three measured food allergy accommodation practices completed by participants using frequency measures to 14 statements (seven items each for kitchen staff and service staff/managers) on a five-point Likert-scale, ranging from 1 = *never* to 5 = *always*.

Section four gathered information about any food allergy training received, when applicable, asked which food allergy topics were included in their training (Yes/No response) and which training topics participants perceived were most necessary using a

five-point Likert-scale, ranging from 1 = *very unnecessary* to 5 = *very necessary*. Section five used three open-ended questions to collect opinions what should be included, excluded, and participants' preferred training formats in future food allergy trainings. Participants were urged to complete the open-ended questions in their preferred language. The final section comprised the demographic portion of the questionnaire.

Literature on Chinese food restaurants in the United States indicates that the employees of Chinese restaurants are predominately ethnically Chinese, often recent immigrants from China, with varying degrees of English fluency (Multicultural Foodservice & Hospitality Alliance [MFHA], 2017). Therefore, to ensure the target population could participate, the questionnaire was translated into Chinese Mandarin (simplified and traditional characters). The translated questionnaires were back-translated to verify accuracy of translation. The final questionnaire and cover letter were available to participants in three written languages: English (Appendix E), Traditional Chinese Mandarin (Appendix F), and Simplified Chinese Mandarin (Appendix G).

Pilot Test. Prior to data collection, the questionnaire was reviewed by an expert panel (n=5). Feedback regarding the format, language, and flow of the questionnaire from the expert panel was used to modify the questionnaire prior to a pilot test. A pilot test was then conducted with a convenience sample (n = 18) of employees in Chinese restaurants in Greater Chicago who were also asked to assess questionnaire for readability, clarity, ease of completion, and time taken (Appendix H-J). The pilot sample completed 15 questionnaires in Chinese and three in English. Revisions were made by the PI based on feedback from participants and observations of participants completing the questionnaire.

The revised questionnaire was again reviewed by the expert panel and again translated and back-translated prior to data collection.

Data Collection

Research has found recruitment and retention of minority participants in research is improved through face-to-face recruitment and by using culturally-matched research personnel and study materials in the appropriate language (George, Duran, & Norris, 2014). Therefore, the PI, who is ethnically Chinese and fluent in Mandarin and Cantonese, completed recruitment and data collection in-person, in hopes of also easing participation barriers for Asian minorities in research, namely, fear of unintended outcomes and issues related to legal status (George, Duran, & Norris, 2014).

All 428 restaurants on the target population were visited in-person by the PI, however, 42 restaurants were closed or incorrectly listed, leaving a sample size of 386 restaurants. Restaurants were visited between lunch and dinner service hours, generally between 2pm-5:30pm, and the first staff member to greet the PI was informed about the reason for the visit, the purpose of the study, the time and effort requested, and confidentially provisions, before inviting the staff member and any other staff members present to participate in the study. As had been approved by IRB, participants were not required to self-identify by signing informed consent documents but were instead given a cover letter containing the elements of a consent document that did not require a signature. Participants were able to retain the cover letter for their reference which included information on the study's confidentiality protections. No incentives were offered to any participants and the PI did not order, consume or purchase any items from any of the restaurants visited.

In total, 101 questionnaires were collected from 98 restaurants, however, three questionnaires were not completed by participants and deemed unusable for data analysis. Ultimately, 98 questionnaires from 98 restaurants were used for data analysis. During data collection, two participants asked to be read the questionnaire (in English) by the PI; in these cases, the PI read the entire questionnaire aloud to the participant and marked on the questionnaire the responses provided by the participant.

Data Analysis

Data collected from the questionnaires was cleaned and checked for accurate coding, with negatively worded items in the attitude and practices sections reverse coded, before being entered SPSS 25.0 for analysis. Descriptive statistics were used to determine frequencies, means and ranges of data collected for each of the sections, and further subdivided into categories for further analysis between groups (i.e. previous training experience, working experience, gender, ethnicity, job title, personal experience with food allergy). Cronbach's alphas were calculated to evaluate reliability of the attitude and practice factors, alpha coefficients were 0.89 and 0.88, respectively; above the 0.7 suggested standard of reliability (Nunnally, 1978). T-tests were conducted to explore differences in knowledge, attitude, and practices, between the various sub-categories. ANOVA were used to compare the differences in means of food allergy knowledge, attitudes, and practices based on respondent demographics. Multiple linear regression analysis was used to determine which variables had the greatest effect on knowledge and practice. Post-hoc Tukey tests were conducted to further examine within group differences. A 0.05 level of significance was used for all statistical analysis.

The open-ended questions were translated, as needed. Data were cleaned, organized and analyzed following the data procedures detailed by Creswell (2014) for coding data and developing themes. A second researcher independently coded the responses; the final themes were agreed upon by the two researchers.

Part Two: Resource Creation

Study Sample

A list of 172 food distributors was collected from a member list from the International Foodservice Distributors Association, as well as an online search of Asian wholesale distributors in the United States. Distributors that were not based in the United States or did not offer packaged goods (such as providers offering only fresh produce and protein) were removed from the list and a random sample of 25 distributors were selected to be contacted. An email with a request for a product list of their most frequently ordered or purchased packaged food items by Chinese restaurants was sent to the distributor's general email address as found on the company's website, along with information detailing the study's purpose, confidentiality provisions, and offering the distributors access to the study's findings (Appendix K). For distributors with only an online contact form, the email's text was submitted via the website; three follow up emails were also sent to distributors at weekly intervals.

As product sales are considered proprietary information distributors were unwilling to provide sales figures but were willing to provide product lists; in total, seven distributors contributed product lists for the study, a sample of one product list can be found in Figure 3.1. The product lists were aggregated into one product list and the 20 most frequently found packaged food categories identified, then, the five most frequently

appearing individual packaged food items within each category was identified for inclusion in the study sample for an effective sample size of 99 products (one product category had only four frequently appearing individual items).

Item	Pack	Size	Brand	Description	Sold By
428902	4	80 oz	Kikkoman	Sauce Orange RTU	
207010	6	5 lb	Kum Chun	Sauce Oyster Chinese	Case
207005	6	5 lb	Lee Kum Kee	Sauce Oyster Chinese "Panda" Brand	Each
997001**	6	5 lb	Lee Kum Kee	Sauce Oyster Chinese no MSG**	Case
206510	4	48 oz	House of Tsang	Sauce Peanut Thai Gluten Free	Each
208005	6	5 lb	Shing Kee	Sauce Plum Chinese	Each
137403	2	64 oz	Chef Myron	Sauce Ponzu Gluten Free	Case
137404	6	64 oz	Kikkoman	Sauce Ponzu Citrus Seasoned & Dressing	Case
137420	1	5 gal	Kikkoman	Sauce Soy	Case
137415	4	1 gal	Kikkoman	Sauce Soy	Each
137411	1	4 gal	Kikkoman	Sauce Soy	Case
137435	4	1 gal	Double Hi	Sauce Soy	Each
137425	1	5 gal	Lee Kum Kee	Sauce Soy Gluten Free	Each
984343**	24	16.9 oz	Pearl River	Sauce Soy (Light Coloring)**	Case
981940**	12	5 lb	Pearl River	Sauce Soy Dark Superior**	Case
137400	6	0.5 gal	Kikkoman	Sauce Soy Lite 37% Less Salt	Each

Figure 3.1 Sample product list received from distributor.

Data Collection

Ingredient labels of the sample were collected for analysis by the PI. The PI visited restaurant wholesale warehouses and manufacturers' warehouses to locate sample items, identify on the item the ingredient label, and collect ingredient lists and allergen

Figure 3.2 Sample item ingredient label location and identification.

declarations and allergen advisories (if any) for analysis. A sample of the ingredient label on one of the study sample is shown in Figure 3.2.

Data Analysis

To verify that major allergens and any processed ingredients derived from or containing allergens found within the packaged food product were accurately declared on the product's ingredient label, a reference list of ingredients containing allergens was created. Using data from allergen lists collected from the Food Allergy Resource & Education [FARE] (2018), the Asthma and Allergy Foundation of America [AAFA] (2018), and the Consortium of Food Allergy Research [CFAR] (2018) a list of allergen terms and derivative products containing major allergens was compiled. The compiled list of ingredients included ingredients containing major allergens and ingredients that may contain major allergens, posing a potential allergen hazard. Items that were listed as potentially hazardous were noted as such. The final list was used during the ingredient labels analysis portion of this research (Appendix L).

Using the list of the major eight food allergen key operational terms and categories complied from a literature review, the PI reviewed the ingredient lists from each item for any food allergens, noting any food allergens listed and indicating the appropriate major food allergen category. Allergy declarations found on food items, as required by FALCPA, as well as any allergy advisories, were also analyzed to assess accuracy of allergy declaration and advisories. The frequency of each major food allergen was calculated to determine the most commonly appearing food allergen in the study's sample. Descriptive statistics were calculated to determine the rate of compliance to FALCPA requirements.

Reference Creation

The collected data and allergen identification results were used to generate an allergen reference database of commonly used packaged foods in Chinese restaurants. The sample items' brands, individual item names, ingredient list, allergen declaration, allergen advisory, and major allergens identified were used in the creation of the allergen reference material (Appendix M).

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CHAPTER 4. FOOD ALLERGY KNOWLEDGE, ATTITUDES, PRACTICES, AND TRAINING EXPERIENCES OF EMPLOYEES IN CHINESE RESTAURANTS

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Abstract

This study conducted a food allergy (FA) needs assessment of employees in Chinese restaurants (n = 98) using a questionnaire to assess FA knowledge, attitudes, practices, and training experiences. Participant knowledge scores were low (M = 7.5/12) and most (67%) participants reported no FA training. Attitude and practice scores were high, suggesting employees were willing to and proactively trying to accommodate individuals with FA. Knowledge scores were found to improve with training. Providing resources to build on employees' positive FA accommodation attitudes and to enhance FA knowledge in support of safe FA practices is suggested.

Keywords: food allergy, foodservice, Chinese restaurants, ethnic food, training needs

Introduction

Food prepared away from home, particularly food from restaurants, are a common source of adverse allergic reactions due to poor staff communication, improper training, and inadequate knowledge of food allergy handling in foodservice operations (Ahuja & Sicherer, 2007; Bailey, Albardiaz, Frew, & Smith, 2011; Jarvinen, 2011, Lee & Sozen, 2016, Lee & Xu, 2015). Over a third (36%) of individuals with food allergy report having experienced three or more reactions because of food from restaurants (Wanich, Weiss, Furlong, & Sicherer, 2008). The reactions frequently occurred after consuming foods that had been considered safe (Ahuja & Sicherer, 2007; Ajala et al., 2010; Bailey et al., 2011; Common et al., 2013).

Previous studies report that cross-contact, miscommunication among staff and with customers, hidden allergens, and incomplete food information are frequently identified as common causes of allergic reactions in foodservice operations, suggesting that a lack of food allergy knowledge and training may be the reason for the mistaken ingestion of an allergen (Ahuja & Sicherer, 2007; Ajala et al., 2010; Bailey et al., 2011; Common et al., 2013; Kwon & Lee, 2012; Wen & Kwon, 2016; Vierk, Koehler, Fein, & Street, 2007). Bailey, Albardiaz, Frew and Smith (2011) concluded staff knowledge of food allergy had "worrying gaps" (p. 716), finding staff knew little about food allergy severity, avoiding cross-contact, and reading food labels for allergens. In an earlier study exploring restaurant staff food allergy knowledge and comfort with serving food allergen safe meals, Ahuja and Sicherer (2007) determined "at this time, the food-allergic consumer must exercise extreme caution and not assume that most restaurants are safe or that food preparers are well-versed in issues of food allergy" (p. 346).

Previous research has found Asian restaurants are a frequent site for allergic reactions due to hidden allergens in the food, cross-contact during preparation and service, and communication problems with staff (Leftwich et al., 2011; Wen & Kwon, 2016). Furlong, Maloney, and Sicherer (2006) reported Asian restaurants to be among the most common restaurant type resulting in allergic reaction. Kwon and Lee (2012) reported Chinese restaurants were identified as high-risk places by food allergic individuals' due to hidden allergens in the cuisine's unfamiliar foods and in the premade sauces or manufactured ingredients. In interviews about their dining out experiences, individuals with nut allergies specified Chinese food as problematic with one participant explaining their fear of the cuisine's heavy reliance on nuts and nut oils in the cooking prevents them from dining at Chinese restaurants (Leftwich et al., 2011). Another participant of the Leftwich et al (2011) study highlighted communication as the reason they perceived Chinese restaurants as particularly risky places for them to dine in, stating the staff struggle with language barriers in addition to generally lacking knowledge about their menus and food allergy.

Chinese food is one of the three most popular ethnic cuisines in the U.S. and the most common cuisine for takeout and delivery (National Restaurant Association [NRA], 2015). Given the prevalence and severity of food allergy, the frequency which food away from home is responsible for an allergic reaction, and the popularity of Chinese food amongst American consumers, enabling Chinese restaurants to safely provide food allergen safe meals for consumers is vital for public safety and business success.

Research into food allergy accommodations in foodservice recommends food allergy training to address employee gaps in knowledge, improve allergen identification

to minimize hidden ingredient hazard, and teach safe food allergen handling practices. Bailey et al (2011) found that by improving staff practices to reduce cross-contamination of allergens, improving communication, and learning how to manage allergic reactions, the likelihood of food allergy incidence in restaurants is likely to decline (Bailey et al., 2011).

Food allergy-specific training for foodservice employees is largely voluntary (Bailey, Kindratt, Smith, & Reading, 2014) and food allergy training programs and resources are currently limited (Lee & Xu, 2015; Sicherer et al., 2012). Research has recommended that in addition to providing a greater range of resources for foodservice professionals on food safety issues like food allergy, resources developed should also be culturally-sensitive and address the specific ingredient and ethnic food practice needs of foodservice professionals in ethnic restaurants (Mauer et al., 2007). Therefore, to improve the cultural sensitivity and effectiveness of food allergy training programs in addressing ethnic restaurant employee needs, an assessment of current food allergy knowledge, attitudes, and practices, as well as exploration into preferred training content and formats, among foodservice employees in Chinese restaurants was necessary. The specific objectives were to:

1. Assess food allergy knowledge and training needs of employees in Chinese restaurants,
2. Assess food allergy attitudes and practices of employees of Chinese restaurants, and,
3. Identify food allergy training preferences for employees in Chinese restaurants.

Methods

Sample Overview

Employees of Chinese restaurants in Metropolitan Chicago were the target population for this study. Using restaurant lists from the Chinatown Chamber of Commerce food directory of Chinatown (Chinatown Chamber of Commerce, 2017), a search of Chinese restaurants on Yelp.com, and a search of business licenses in the City of Chicago Business Affairs and Consumer Protection database (City of Chicago, 2018), a list of Chinese restaurants (N = 428) in metro Chicago was developed. Illinois was chosen for its recently enacted food allergy-related legislation (State of Illinois HB 2510 Law) requiring the completion of an American National Standards Institute (ANSI)-accredited food allergen awareness training by restaurant-employed foodservice sanitation managers by July 1, 2018 (Illinois State Legislation, 2016). Data collection was completed during April and May 2018.

All 428 Chinese restaurants compiled for the target population of this study were included in the sample for this study. Forty-two restaurants could not be included due to Board of Health closure or inaccurate business information, yielding an effective sample size of 386 restaurants. Prior to data collection, approval to use human subjects for this study was obtained from Iowa State University's Institutional Review Board (Appendix A).

Survey Instrument

The survey instrument was adapted from a previous study by Choi and Rajagopal (2013) which used a questionnaire to explore food allergy knowledge, attitudes, practices, and training of foodservice employees in college and university foodservice operations.

Adaptations to the questionnaire were made based on a literature review of food allergy, food allergy training, and survey development (Dillman, Smyth & Christian, 2014; Food and Drug Administration [FDA], 2018). Author permission was obtained for use of the questionnaire.

The final questionnaire used in data collection (Appendix E-G) comprised of five sections. The first section investigated participant attitudes by recording their level of agreement on a five-point Likert-scale, ranging from 1 = *strongly disagree* to 5 = *strongly agree* to 16 statements regarding food allergy customers, training, and practices. The next section (section two) used 12 multiple choice questions to evaluate food allergy knowledge. Participants were asked to recall the frequency of food allergy accommodation practices using a five-point Likert-scale, ranging from 1 = *never* to 5 = *always*, against 14 statements in section three.

Section four reviewed whether participants had received any food allergy training, and if so, examined which food allergy topics were included in training (Yes/No response) and which topics the participants perceived as necessary to receive food allergy training in by noting it on five-point Likert-scale, ranging from 1 = *very unnecessary* to 5 = *very necessary*. Open-ended questions to collect opinions on future food allergy trainings (what to include, exclude, and preferred formats) constituted section five. The final section (section six) contained the demographic questions.

The questionnaire was reviewed by a panel of experts before data collection. A pilot test was completed using a convenience sample (n = 18) of Chinese restaurant employees and participant feedback about the questionnaire was collected (Appendix H-J). Changes to the questionnaire were made based on the feedback received from the

expert panel and pilot test. Prior to data collection, the final questionnaire was translated into Chinese and then and back-translated for translation verification.

Data Collection

As the PI is ethnically Chinese and fluent in Mandarin and Cantonese, participant recruitment and data collection were conducted in-person. This method of data collection was selected as previous research found recruitment and retention of minority participants was improved through face-to-face recruitment by culturally-matched researchers and materials in the appropriate language (George, Duran, & Norris, 2014). By completing data collection in person, the PI also hoped to lessen participant fears of Asian minorities in research, such as a fear of issues related to legal status, which was particularly relevant to the current study's population (George, Duran, & Norris, 2014).

The PI visited every restaurant between 2pm-5:30pm in the target population in-person, approaching the first staff member available with information about purpose of the visit and study, the participation request, and the study's confidentially provisions. Any staff members present were invited to participate in the study. A cover letter, available in English, and Traditional and Simplified Chinese, was also attached to the questionnaires detailing the study's purpose and participant information (Appendix B-D). By request of two participants, the PI read the questionnaire aloud and marked on the questionnaire the responses provided by the participant on their behalf. Participants selected their preferred questionnaire language from English, Traditional Chinese, or Simplified Chinese. No incentives or compensation was offered to participants in the study; the PI did not purchase or consume any foods from any of the visited restaurants during data collection.

Data Analysis

Data were analyzed using SPSS (Version 25.0). Descriptive statistics were calculated. Negatively worded items in the attitude and practices section were reverse coded. Cronbach's alphas were calculated for attitude and practice factors to assess reliability, resulting in alphas of 0.89 and 0.88, respectively. One-way analysis of variance (ANOVA) and independent t-test were conducted to compare the differences in means of food allergy knowledge, attitudes, and practices based on the respondents' demographic characteristics. Multiple linear regression analysis was used to determine which variables had the greatest effect on knowledge and practice. Post-hoc tests (Tukey) were conducted to further examine within group differences. A 0.05 level of significance was used for all statistical analysis.

The written responses to the three open-ended questions were translated into English, as needed and analyzed following the data procedures detailed by Creswell (2014) for coding data and developing themes from the data. A second researcher coded the responses independently before the two researchers agreed upon final themes.

Results

Of the 428 restaurants in the sample, 42 restaurants were closed or incorrectly listed, leaving a sample size of 386 restaurants. After excluding three incomplete questionnaires, 98 usable questionnaires collected from 98 restaurants remained for data analysis, resulting in a 25.4% response rate.

Participant and Restaurant Characteristics

The respondent profile of the study's participants is shown in Table 4.1. Respondents were predominantly female (n = 52, 53.1%), 34-41 years old (n = 25,

25.8%), and possessed high school diplomas or GEDs (*n* = 42, 42.9%). Most (*n* = 82, 83.7%) respondents were born outside the U.S. and most commonly preferred communicating in Mandarin (*n* = 43, 43.9%) or Cantonese (*n* = 35, 35.7%), describing their English fluency as "average" (*n* = 40, 41.7%).

Most of the participants worked at casual full-service foodservice operations (*n* = 35, 36.1%) followed closely by takeout and delivery establishments (*n = 30*, 30.9%) (Table 4.1). No Chinese buffet employees agreed to participate in the study. Respondents were mostly full-time (*n* = 64, 65.3% 40+ hours per week at work), had over eight years of experience in foodservice (*n* = 49, 50.0%) and Chinese restaurants (*n* = 45, 46.4%).

Over half (56.8%, *n* = 54) of participants reported customers with food allergies visited their restaurants with 27 (36.5%) participants reporting food allergy customers visited frequently (defined as more than 12 customers per year). The most commonly reported food allergy by customers was peanuts (*n* = 65), followed by seafood (*n* = 37), and wheat (*n* = 27). Most participants (*n* = 68, 70.1%) reported receiving food safety training but only about one-third (*n* = 32, 32.7%) received food allergy specific training.

Food Allergy Knowledge

The mean food allergy knowledge score was 7.5 ± 2.8 (range = 0 to 12) (Table 4.2). Respondents demonstrated basic food allergy knowledge, correctly identifying fruit as not a major allergen (*n* = 60, 82.5%), as well as the symptoms and onset timeline of an allergic reaction (*n* = 61, 63.5% and *n* = 79, 81.4%; respectively). Over three-quarters (*n* = 74, 77.9%) of participants correctly identified kitchen cross-contact practices that could compromise food allergy safety, while 69.8% (*n* = 60) accurately recognized cross-contact service practices.

Nearly 70% (*n* = 66, 68.8%) of respondents knew no amount of a food allergen was safe for an individual with the food allergy to consume. When asked which foods posed the greatest potential hazard for food allergic customers, nearly half (*n* = 47, 51.1%) correctly selected the answer ("All of the above") however, menu items with multiple ingredients was selected by over one quarter of respondents (*n* = 24, 26.1%). Participant responses to where allergen information in an ingredient can be found were closely divided between "reading the ingredient label" (*n* = 44, 46.3%) and "the customer should know what foods they cannot eat" (*n* = 43, 45.3%).

Nearly one-third of respondents did not select an answer for a question regarding the best treatment for controlling a severe food allergic reaction, explaining to the PI during data collection, often saying during data collection that they left the question blank because they did not know the answer, thus the question recorded only 69 responses. Of the participants that did select an answer, most incorrectly selected "Benadryl™" (*n* = 39, 56.5%) over the correct response of Epinephrine (*n* = 21, 30.4%). Most (*n* = 63, 65.6%) respondents accurately identified calling for medical help as the best first response to an allergic reaction, though several respondents believed the correct responses were identifying the cause of the reaction or administering epinephrine was the appropriate response (*n* = 20, 20.8% and *n* = 13, 13.5%, respectively).

Food Allergy Attitudes

Participants had a mean attitude score of 3.62±0.47 (1 = *strongly disagree*; 5 = *strongly agree*) with a range of 2.00 to 4.56 (Table 4.3). Attitude scores about providing customers food allergen information were high ("It is important about food ingredients is provided to customers", *M* = 4.13, *SD* = 0.79; "I believe that providing customers with

food allergy information will decrease the likelihood of a food allergic reaction", *M* = 4.01, *SD* = 4.01) as were attitudes towards changing food handling behaviors relating to food allergens (*M* = 4.00, *SD* = 0.81) and personal responsibilities regarding preventing food allergy reaction on the job (*M* = 3.96, *SD* = 0.94).

Employees' attitude scores regarding whether their workplace should refuse customers with food allergy (*M* = 3.90, *SD* = 0.91), whether serving them was "not worth the potential liability" (*M* = 3.84, *SD* = 0.83), and whether they should avoid dining out (*M* = 3.82, *SD* = 0.84) had similar means. The statement "food allergy customers are just picky eaters" had a mean attitude score of 3.79 (*SD* = 1.03). The statement "I believe it is entirely the customers' responsibility to avoid food allergens" received the lowest attitude score (*M* = 2.70, *SD* = 1.05).

Attitude scores towards food allergy training were lower than attitude scores about regarding food allergy reaction prevention and customers with food allergy. Statements about food allergy training being "not a good use of time" (*M* = 3.79, *SD* = 0.85), being of personal importance ("learning about food allergy is important to me", *M* = 3.72, *SD* = 0.90) or usefulness ("food allergy training is not useful to me", *M* = 3.63, *SD* = 0.98), or about a general willingness to attend training courses or workshops (*M* = 3.65, *SD* = 0.75) had attitude scores closer to the sample's mean score of 3.62 (*SD* = 1.47).

To test construct validity of the adapted questionnaire's attitude measures, a factor analysis was conducted. The factor analysis with varimax rotation extracted five factors with eigenvalues > 1 for attitude, which accounted for 75.58% of the total variance. Overall, the factor analysis of the attitude items revealed that all items with the same

response scale loaded onto a factor. The first factor consisted of 12 items (average variance extracted [AVE] = 0.474), the second factor was revealed to include six (AVE = 0.362), factors three (AVE = 0.270) and four (AVE = 0.451) had four and two items, respectively. The final factor consisted of three items (AVE = 0.0.313).

Food Allergy Practices

Mean scores for kitchen staff and service staff and managers reported frequency of safe food allergen handling practices can be found in Table 4.4. Kitchen staff had a mean practice score of 4.27±0.68 (mean range = 4.11 to 4.50) while service staff and managers had a mean practice score of 4.33±0.66 (mean range = 4.14 to 4.61) giving an overall practice mean score across all restaurant areas of 4.29±0.64. During data collection, participants noted their roles crossed multiple areas of the restaurant, including kitchen work, like food preparation, service work, such as taking orders from customers in person and over the phone, and occasionally management, in the absence of a formal manager. Therefore, where applicable, participants filled out practice questions for both kitchen staff and service staff and managers.

Kitchen staff. Respondent practice scores for communicating about food allergy needs between staff members ("I communicate with other staff members to ensure an allergy safe meal is prepared", M = 4.5, SD = 0.84) and knowing how to handle customers with food allergy ("When a customer with a food allergy comes in, I know exactly what to do", M = 4.49, SD = 0.79) received the highest practice scores. The lowest practice scores were associated with checking ingredient labels for allergens ("I read labels of ingredients when preparing food for a customer with a food allergy", M =

4.11, *SD* = 1.15) and workplace policies and training ("My workplace has told me what I should do when someone tells me they have a food allergy", *M* = 4.12, *SD* = 1.22).

Service staff and managers. Mean scores for service staff and managers were also high. The statement "I wash my hands before serving customers with food allergy their food" had the lowest mean practice score of 4.14±1.11, followed by "my workplace has told me what I should do when someone tells me they have a food allergy" which received a mean practice score of 4.22±1.17, mirroring the lower score also recorded for the same statement by kitchen staff. The practice statements regarding food allergy communication received the highest scores, the highest being communication amongst staff ("I communicate with other staff members to ensure an allergy safe meal is prepared", *M* = 4.61, *SD* = 0.77), followed by communication with customers ("I provide accurate information to customers regarding a dish's ingredients", *M* = 4.51, *SD* = 0.83).

Food Allergy Training and Perceived Needs

Of the respondents that had received food allergy training (*n* = 32), the majority reported receiving training across all training items (Table 4.5). Over 90% reported receiving training in identifying major food allergens (93.8%), reading food labels for allergens (90.6%), avoiding cross-contact (93.8%), and communicating allergen information to customers (93.8%). The lowest reported area of training was for how to handle allergic reactions as only 71.9% of respondents reported having received training on food allergy reaction management, lower than for any other category.

Participants' responses to the perceived need of food allergy training were high for most items on a scale ranging from 1 = *very unnecessary* to 5 = *very necessary* (Table 4.6). The mean score for perceived need of training was over 4.5 surrounding items

including identification of major food allergens, reading food labels for allergens, avoiding cross contamination, and communicating food allergy information to customers. Mirroring the pattern found in the responses regarding training received, the lowest mean score for perceived need was for training on how to handle an allergic reaction (M = 4.41, SD = 1.27). Training on how to avoid cross-contact between foods during food preparation or service highest perceived training need mean score of 4.56 (SD = 0.95).

Food Allergy Training and Food Safety Certification

Independent-samples t-tests were conducted to compare the knowledge, attitude, and practice scores of participants that had and had not received food allergy training. Table 4.7 shows the means for knowledge, attitude and practice scores of participants with and without food allergy training and food safety certification. A significant difference was found at the p<.05 level in mean scores for food allergy knowledge, t(94) = 3.486, p =.001), attitudes, t(94) = 2.520, p =.013, and practices, t(81) = 3.904, p =.000 with participants that had completed food allergy training.

An independent t-test was also conducted to compare the knowledge, attitude, and practice scores of participants with and without food safety certification. Participants that had food safety certification had significantly different mean scores than those that did not have food safety certification for food allergy knowledge (t(93) = 4.003, p < .000), attitudes (t(93) = 2.235, p =.028), and practices (t(37) = 3.497, p <.001).

Differences in Knowledge, Attitudes, Practices, Based on Demographic Characteristics

Independent t-tests and one-way analyses of variance (p < .05) were used to assess differences in knowledge, attitudes, and practices across demographic

characteristics. A significant difference [$F(4, 92) = 2.658$, $p = .038$] was found for mean knowledge scores between age groups. A Tukey post hoc test revealed that the knowledge scores for 18-25-year-old (9.21 ± 2.49) were significantly different ($p = .016$) than those of the 42-49-year-old (6.00 ± 2.50) age group, but no significant difference was between any other age groups. No significant difference was found between age groups for mean attitude or practice scores.

Mean knowledge scores also differed significantly [$F(4, 93) = 2.744$, $p = .033$] between respondents' reported education levels but no significant difference was found for attitude or practice scores. Tukey post hoc tests revealed a significant difference ($p = .047$) in knowledge scores between participants that completed high school or received a GED (6.92 ± 2.75) and those with a master's degree (11.00 ± 0.82). No significant difference was found between the remaining education levels.

Having a family member with food allergy resulted in significant differences in knowledge ($t(92)=3.081$, $p = .003$), attitude ($t(42) = 3.752$, $p = .001$), and practice ($t(39) = 3.670$, $p = .001$) scores than without family members with food allergy. A participants' place of birth saw significant differences in knowledge ($t(94) = 2.929$, $p = .004$) and practice scores ($t(94) = 2.286$, $p = .025$) scores but not attitude scores. Mean knowledge scores for U.S.-born participants (9.38 ± 2.47) were over two-points higher than scores for those born outside the U.S. (7.21 ± 2.74).

A respondent's preferred language and familiarity with English also had significant impacts on knowledge scores. A significant difference was found at the $p<.05$ level for knowledge scores $F(3, 94) = 5.289$, $p = .002$ between the languages the participants reported as most comfortable for communication. Post hoc analysis using the

Tukey HSD test found that the mean knowledge score for those with a preference for Mandarin (7.21 ± 2.82, p = .009) and Cantonese (6.69 ± 2.71, p = .001) had significantly different mean scores than participants with a preference in communicating in English (9.61±21). A significant difference was found at the p<.05 level for knowledge scores (F(4, 91) = 6.717, p < .000) amongst the reported level of English fluency of the respondents. Tukey post hoc tests revealed mean knowledge scores for those with "Excellent" English fluency (9.33 ± 2.39) was significantly different than those that had "Good" (6.41 ± 2.50, p=.003), "Poor" (5.67 ± 2.02, p=.001), or "None/I don't speak any English" (4.67 ± 2.52, p=.024).

Foodservice industry experience saw a significant difference at the p<.05 level for practice scores (F(4, 91) = 2.844, p=.028), however, no significant difference was found for knowledge or attitude scores. Participants with 8+ years of industry experience (4.48 ± 0.51) has significantly different practice scores than those with 4-6 years of foodservice industry experience (4.01 ± 0.68, p=.028). Years of experience in Chinese foodservice saw a significant difference in mean attitude scores at the p<.05 level, F(4, 92) = 3.086, p=.020. No difference in scores was found for knowledge or practices based on Chinese foodservice experience. A Tukey post hoc test found participants with 1-3 years of Chinese foodservice experience (3.84 ± 0.37) were significantly different (p =.017) from those with 4-6 years of Chinese foodservice experience (3.34 ± 0.56).

Frequency of customers with food allergy visiting participants' restaurants also saw a significant difference on respondents' knowledge scores, F(3, 70) = 8.453, p=.000 but did not result in significant differences for attitude and practices scores. A Tukey HSD test found participants that reported seeing customers with food allergy frequently

(12+ food allergic customers per year) (9.52 ± 2.24) had significantly different scores than those that reported food allergy customers visited rarely (4 or less per year) (6.48 ± 2.66, p=.000) and occasionally (5-8 per year) (6.47 ± 2.92, p=.001).

Correlation and stepwise multiple regression analysis were used to test if attitude, knowledge, previous food allergy training, or food safety certification significantly (p > .05) predicted participants' safe food allergy handling practices (Table 4.8). Each of the predictors were all positively and significantly correlated with food allergy practice scores. Significant positive correlations were also found between food allergy practice scores and food safety certification (r = 0.393, p =.000), food allergy training (r = 0.342, p =.001), and years of foodservice industry experience (r = 0.202, p =.048).

Attitude scores and knowledge scores were also positively and significantly correlated (r = 0.380, p =.000) and food allergy attitude scores also had significant positive correlations with food safety certification (r = 0.231, p =.023) and food allergy training (r = 0.263, p =.009). Food allergy knowledge scores were significantly and positively correlated with food safety certification (r = 0.391, p =.000) and food allergy training (r = 0.349, p =.000). A significant positive correlation was found for food allergy knowledge and level of education completed (r = 0.271, p = .007).

Stepwise multiple regression analyses were conducted to examine the relationship between safe food allergy handling practices and food allergy knowledge, attitude, food allergy training, and food safety certification. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.545. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals

versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1.

The stepwise multiple regression analysis found a significant result with the food allergy attitude and food safety certification predictors and safe food allergy handling practices. The results of the regression indicated that the predictors explained 24% (adjusted $R^2 = 0.239$) of the variance ($R^2 = 0.255$, $F(2, 92) = 15.751$, $p = .000$) for a small effect size. The significant findings were examined further with the coefficients of the regression model computed for further analysis. It was found that food allergy attitudes ($\beta = 0.326$, $p = .001$) and food safety certification ($\beta = 0.319$, $p = .001$) significantly predicted safe food allergy handling practice scores. The regression summary can be found in Table 4.9.

Food Allergy Training Preferences

Participants were asked to complete three open-ended questions regarding food allergy training preferences, specifically, what should be included in food allergy trainings, what should be excluded in food allergy trainings, and their preferred formats for food allergy training. Seventeen respondents wrote in responses for the first question ("If you were to design a food allergy training program for your workplace, what would you **include**?"), with the most frequent response ($n = 16$) suggesting the inclusion of information to help with understanding what food allergens are and knowing how to identify and recognize food allergens. Five respondents specifically commented that training should provide information on allergens in sauces, foods, or dishes/meals and help employees identify dishes where food allergens were not present. In four responses participants asked for information on how to read food labels for allergens in training

programs, with one respondent writing, “make sure kitchen staff knows the name of [food allergens] in English” as well as in Chinese, and another saying it was important for employees to know “how [allergens] can hide [in] different dishes.” Respondents also wanted to include separate food allergy training specific to safely preparing foods for kitchen staff (n = 8) and serving foods for service staff (n = 6). The inclusion of communicating to customers, both how to and the importance of relaying accurate information regarding food allergens, was specifically mentioned in six written responses, saying servers need to “be honest to customers” by “telling the truth if you do not know for sure you can [provide a safe meal to a customer with a food allergy].” Three respondents deemed information regarding the potential health consequences of ingesting a food allergen for those with food allergy were important to include and two respondents wanted information on how to handle food allergy reactions.

Ten participants completed responses for the second open-ended question, “if you were to design a food allergy training program for your workplace, what would you **exclude**?” Respondents believed that food allergy training should not exclude anything, that is, to include all topics surrounding food allergy. Responses to this question focused primarily on attitudes of potential trainees rather than content, as was the case with the first open-ended question, saying that staff should not be included in the training if “they are not serious about it” or “do not want to learn” about food allergy. Similarly, training should exclude anything that reinforced negative stereotypes about people with food allergies and avoid presenting food allergy customers as “just being difficult” or “picky” eaters.

Participants were asked to identify what they felt would be an ideal format for a food allergy training (Table 4.10). Nearly half of respondents (n = 24, 41.38%) indicated a preference for booklets/posters/flyers as the format for a training program, liking that they could "go over it on [their] own time" and that they could "always refer back to it" later. Many (n = 16, 29.09%) also requested a program in a traditional classroom-style setting with a lecture that presented the important material. One respondent saying they liked the class lecture format "so everyone can take notes" and that the class should include a "booklet and posters for extra help" in understanding the information. Eleven participants were interested in an online class format for the training, but another respondent made it clear that computer literacy levels varied significantly and that it may not be a good option for everyone.

Some respondents noted other training program considerations, including a need for programs to be offered in multiple languages (n = 2), to include visuals (n = 1), and to create programs that emphasized a personal perspective to make the experience of having food allergy or a food allergy reaction "more relatable." One respondent stated to the PI during data collection, "my uncles didn't want to bother with [customers with food allergy] and didn't take it seriously until they saw a loved one in the hospital; that's when they started to understand." Additionally, one participant remarked that printed materials should understand the varying literacy levels within foodservice employees and that the examinations should come in multiple choice and true/false question formats.

Discussion

This study assessed food allergy knowledge, attitudes, practices, and food allergy training needs and preferences of employees of Chinese restaurants. The current study

found areas of knowledge where improvement was needed. Results found that while participants were able to correctly identify major food allergens, food allergy reaction onset and symptoms, as well as some allergen-safe kitchen and service practices, there were the major areas where knowledge was lacking among participants: cross-contact, identifying hidden allergens and the use of food ingredient labels, and, responding to food allergy reactions.

Participants' scores indicate they were knowledgeable about practices to prevent cross-contact but had lower knowledge scores when asked how cross-contact occurs and how it can be dangerous for individuals with food allergy, suggesting that respondents may be following practices learned from food safety that prevent foodborne illness rather than preventing allergic reactions. This finding is consistent with past research that found foodservice managers would use the terms "cross-contamination" and "cross-contact" interchangeably and were unaware of the difference between the terms (Wen & Kwon, 2016), namely that "cross-contact" refers to the transfer of an allergen from an allergen-containing food to an allergen free food, whereas "cross-contamination" refers to the transfer of microorganisms from across food and/or equipment (Food Allergy Research & Education [FARE], 2018). Following safe food handling practices is important in the reduction of foodborne illness outbreak, however it does not lessen the risk of an allergic reaction due to cross-contact (FARE, 2018) which customers believe to be one of the major causes of food allergy reactions in restaurants (Kwon & Lee, 2012). Training focusing on the severity of allergy and the importance of cross-contact—and how it differs from cross-contamination—has been suggested by medical professionals in the past (Sicherer & Sampson, 2018). Future training programs may wish to consider

providing a glossary of food safety and food allergy terms and offer examples that help illustrate the concepts. Additionally, understanding food allergy as an immunological disorder could help provide context for safe food allergen handling practices and explain how cross-contact occurs and should also be considered for inclusion in future trainings.

Food allergy reactions in restaurants are frequently attributed to the unknown consumption of an unidentified, or hidden allergen (Anibarro, Seoane, & Mugica, 2007; Vierk et al., 2007). Hidden allergens have been identified as particularly problematic in Chinese restaurants due to the use of premade sauces and dishes (Kwon & Lee, 2012). Thus, it is recommended for food allergic individuals and anyone involved in the "purchasing, preparing, or serving of food to allergic customers" to be educated about the careful reading of food labels to reduce accidental exposure to allergens (Sheth et al., 2010). Problematically, as this current study's findings show, participants lack knowledge regarding the use and reading of food labels to reference whether ingredients contained within a sauce or food item contain a food allergen and reported the lowest practice score for the reading of food labels for food allergen identification. Future trainings should place greater emphasis on the dangers of hidden allergens for customers and how to help lessen the risk by understanding when, how and why reading labels can help prevent food allergy reactions.

Based on the findings, respondents' knowledge and training gaps also extended to responding to food allergy reactions. Participants struggled with identifying the correct medication used in a severe allergic reaction (only 30.4% correctly selected epinephrine) and selecting the best first response to a reaction in the restaurant with nearly one-third of respondents believing identifying the cause of the reaction or administering epinephrine

was the appropriate response (n = 20, 20.8% and n = 13, 13.5%, respectively). Past research reports that foodservice employees felt unsure and untrained on what to do if a customer has an allergic reaction (Radke et al., 2017), which is supported by the current study with just over a quarter (28.1%) of respondents reporting no training on how to handle an allergic reaction as compared to training on identifying food allergens (6.3%), reading food labels (9.4%), cross-contact (6.3%), and risk communication (6.3%). Yet despite the participants' low knowledge scores regarding reaction management and self-reported lack of training regarding reaction management, participants' perceived need of training regarding food allergy reaction was lower than other topics of food allergy training, supporting previous research concluding that foodservice employees had misplaced confidence in their own food allergy knowledge and training needs (Ahuja & Sicherer, 2007; Bailey et al., 2011; Common et al., 2013). Medical journals and food allergy advocacy groups advise immediate action particularly when handling a severe allergic reactions (anaphylaxis) to reduce the risk of fatalities (National Academies of Sciences, Engineering, and Medicine [NASEM], 2016; Sicherer & Sampson, 2018). Given the importance of a timely, appropriate, and accurate reaction to an allergic reaction is critical in the prevention of fatality, trainings should not only include, but heavily emphasize, how to appropriately respond to reactions to reduce preventable deaths as foodservice employees are not aware of their own knowledge gaps and training needs.

Implementation of food allergy accommodation policies or strategies can help reduce incidents of food allergy reaction in restaurants by improving communication between staff and with customers, and by ensuring accurate information is provided to

customers (Wen & Kwon, 2016). Previous literature indicates that a lack of formal policies had been common in foodservice (Enriquez, Furlong, Ibrahim, & Twersky-Bumgardener, 2007) but more recent research suggests that for many restaurants across the U.S. the trend has changed, and food allergy accommodation strategies are increasingly commonplace (Lee & Barker, 2017). This was not necessarily reflected in the restaurants included in this sample, as seen in the kitchen and service staff's food allergy practice score for policies and training, suggesting that sample's restaurants likely lacked formal food allergy policies or accommodation procedures. Despite this, the respondents of this study had high attitude scores towards providing customers with accurate food ingredient information and adapting food handling practices to accommodate food allergy customers indicating that employees are willing to participate in practices to help reduce food allergy reaction in restaurants. Given the importance of risk communication in the reduction and prevention of food allergy reaction in restaurants (Wen & Kwon, 2016; Leftwich et al., 2011) and the willingness of employees to communicate accurately with customers regarding food allergy as found in the current study, it may be beneficial for future food allergy resources to provide information specific to managers, about how to develop and implement food allergy policies that capitalize on employee interest improving their own practices, particularly with regard to risk communication with customers, for their foodservice operations.

Overall, the current study found food allergy knowledge to be poor. In a previous study assessing food allergy knowledge of foodservice professionals using a separate questionnaire, a national sample reported food allergy knowledge scores of 70.5% (M = 19.74/28) and 72.2% (M = 20.21/28) for Alabama (Lee & Barker, 2017), both higher than

the current study's score of 62.5% (M = 7.5/12). Although the results of the two studies cannot fairly be compared given the different instrument used in knowledge assessment, the Lee and Barker (2017) study provides some data to contrast these findings against. Thus, the lacking food allergy knowledge of the study's participants may provide one possible explanation for the higher allergy incidence rate in Chinese restaurants.

Participants with food safety certification were found to have higher knowledge, attitude, and practices scores than participants that did not, and those with food allergy training resulted in even higher mean scores across all categories. The results show that food safety certification can improve food allergy knowledge, attitude, and practices, but that targeted food allergy training resulted in even greater improvement of food allergy knowledge, attitudes, and practices. As food safety certification and food allergy trainings were found to significantly correlate with increased knowledge, which in turn improved attitudes, contributing to safer food allergen handling practices, ensuring the ready availability of food allergy training and resources for foodservice employees of Chinese restaurants to address the gaps in knowledge and the resulting attitude and practice gaps may help reduce incidence of food allergy reaction.

Despite new regulations made to the Food Handling Regulation Enforcement Act in Illinois requiring American National Standards Institute (ANSI) allergen awareness training of all food protection managers working in restaurants (effective January 1, 2018 to be enforced July 1, 2018), few participants were aware of the new regulation and compliance was low as only one-third of participants had any food allergy training.

Although past research reports that barriers to food allergy training include lack of awareness, knowledge, and training (Kwon & Lee, 2012), as well as lack of employee

commitment and interest, scheduling issues, and high employee turnover (Lee & Barker, 2017), the current study found that respondents did not have negative attitudes towards food allergy training, suggesting that additional, alternate barriers to training may also exist.

The present study's results with regards to participant knowledge, preferred language, and self-reported English fluency suggests language as a training barrier, supporting previous findings of food safety training in ethnic restaurants (Choi & Rajagopal, 2013; Liu & Kwon, 2013). Respondents with greater comfort communicating in English (having selected English as their preferred language) and with higher levels of self-reported fluency in English had greater knowledge scores than those that were more comfortable communicating in Mandarin or Cantonese, or that reported "good", "poor", or "none/I don't speak English" fluency levels.

Additionally, differing cultural values have been identified in past research has barriers to the promotion of food safety (Mauer et al., 2006; Liu & Kwon, 2013). This study found that the level of knowledge regarding food allergies were lower for foodservice employees born outside the U.S., supporting previous findings that food allergy was relatively unfamiliar to Asians and was not yet recognized as a medical condition in the general population within Asia (Lu, Elliot, & Clarke, 2014). Comments by participants to the PI during data collection or in written responses included, "our customers are mainly Hispanic, they don't have food allergies, only white people do" or "[Chinese people] don't have this problem, we don't have allergy." Indeed, in their research, Lu, Elliot, and Clarke (2014) found that food allergy was unknown to many of the study's participants and that allergen terms were not familiar to participants as only

28% of participants were able to say food allergy in Chinese (Mandarin or Cantonese) and none could identify a Chinese term for "anaphylaxis", confirming the need for culturally appropriate food safety resources to improve consumer food safety in ethnic restaurants (Mauer et al., 2006). Thus, for future food allergy trainings, simply translating food allergy training programs in a greater diversity of languages to address language barriers may not be sufficient, as trainings translated into Chinese still may not adequately address whether the programs are appropriately meeting the cultural needs and using the correct terminology to best communicate the varied topics within food allergy as it pertains to the foodservice industry.

Previous literature found customers' perceived employee attitudes towards individuals with food allergy as a barrier to food allergy accommodation, believing restaurant staff considered accommodation requests as a nuisance (Kwon & Lee, 2012). Attitude score results indicate that foodservice employees in Chinese restaurants had predominately positive attitudes towards welcoming customers with food allergies and did not wish to exclude them from the restaurant or perceive them to be difficult diners, mirroring previous studies about foodservice employees' attitudes and food allergy with the majority of employees having more positive attitudes towards food allergy than are believed or perceived by customers (Choi & Rajagopal, 2013; Leftwich et al., 2010). However, the positive attitudes were not universal, and comments made by some respondents (n = 7) to the PI during data collection and in the written responses on the questionnaire reported some negative attitudes. Respondents felt there was "no point in [individuals with food allergies] eating out" and "to be honest, if you have allergies don't go out to eat!" Two participants refused to serve customers with food allergy. One

respondent relayed during data collection that a friend's restaurant was found responsible for a customer's fatal allergic reaction and the ensuing lawsuit and negative press had bankrupted and driven the family out of town. Although the comments came from a small percentage of the study's overall sample (7.14%), the comments made to the PI provide insight into the differing attitudes of employees which could prove to be a future barrier toward training. Future trainings should develop programs that help encourage empathy for individuals with food allergy, emphasize the potential benefits of accommodating food allergic individuals, and create targeted training for managers to create supportive food allergy safety cultures, which have been shown to support positive work habits for food safety (Arendt, Strohbehn, & Jun, 2015).

Conclusions and Applications

This study assessed food allergy knowledge, attitudes, practices, and food allergy training needs and preferences of employees of Chinese restaurants. Findings showed that most employees in Chinese food restaurants did not receive food allergy training, however those that did complete food allergy training had improved knowledge, attitudes, and practice scores. Despite the low rate of food allergy training, employees' attitudes and self-reported accommodation practices were high indicating that employees are willing to adapt and were already incorporating practices to accommodate individuals with food allergy. Poor food allergy knowledge suggests practices were completed without the context of knowledge, likely limiting the efficacy of safe food allergy handing practices.

This study supported past research findings that food safety training for ethnic foods should be culturally appropriate and specific to ethnic-foods, to ensure effective

communication in the appropriate languages, and be easily accessible to the foodservice industry (Mauer et al., 2006). Training preferences noted by respondents also included an interest in printed materials (poster, flyer, booklet) with information and/or visuals that referenced Chinese cuisine specific dishes in the appropriate Chinese dialect (Mandarin, Cantonese, etc.) that could be kept as a reference guide in future. Programs should also be further developed to meet the needs of food allergy training identified in this research, placing greater emphasis preventing allergic reactions (cross-contact, risk communication) and responding appropriately to incidences when they do occur.

To ensure accessibility, reference resources for employees of Chinese restaurants should be developed and provided freely to restaurants to ensure food allergy information is reaching foodservice staff other than the managers required to complete ANSI-accredited training. Thus, capitalizing on the willingness of employees to accommodate food allergy customers and providing opportunities to improve food allergy knowledge without necessitating formalized food allergy training. Future trainings should also look towards developing programs specifically targeted at managers to assist in the development and implementation of accommodation policies and strategies to ensure the lessons of food allergy training are continued into the workplace.

The present study has some limitations. The study used a sample of employees in Chinese restaurants in Chicago, Illinois, therefore, the results cannot be generalized to other ethnic restaurants or other metropolitan areas. The respondents' higher food allergy attitudes scores may be due to avidity bias among the participants, as those willing to participant in the study had a greater interest in the topic, potentially enhancing the study's overall attitude scores. Additionally, food allergy handling practices were self-

reported which may have resulted in higher scores due to respondent bias, as participants may have selected what they believed to be the desired responses and not responses that reflected their actual practices.

During data collection, the PI noticed that several respondents preferred discussing their attitudes and practices to completing the survey, revealing information that was not necessarily reflected by the data collected by the questionnaire. Given that attitudes towards food allergy have been found to be a possible cultural barrier for safe food allergy practices, future studies examining attitudes of Chinese restaurant employees may wish to use a qualitative approach to more fully explore attitudes. Future research exploring the food allergy training needs of employees of other ethnic cuisines that have been identified as high risk for individuals with food allergy could also help provide information for improving food allergy training.

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Table 4.1 Questionnaire participant demographics

Category	*n*	%
Gender (*n* = 98)		
Female	52	53.1
Male	42	42.9
Prefer not to Answer	4	4.1
Age (*n* = 97)		
18-25 years old	14	14.4
26-33 years old	24	24.7
34-41 years old	25	25.8
42-49 years old	16	16.5
Over 50 years old	18	18.6
Place of Birth (*n* = 98)		
United States	16	16.3
International/Outside the United States	82	83.7
Preferred Language (*n* = 98)		
Mandarin	43	43.9
Cantonese	35	35.7
English	18	18.4
Arabic	2	2.0
English Fluency (*n* = 96)		
Excellent	18	18.8
Good	19	19.8
Average	40	41.7
Poor	10	10.4
I don't know any English	9	9.4
Highest Level of Education Completed (*n* = 98)		
Some high school	13	13.3
High school/GED	42	42.9
Associate degree	13	13.3
Bachelor's degree	26	26.5
Master's degree	4	4.1
Years of experience in foodservice (*n* = 98)		
Less than 1 year	7	7.1
1-3 years	3	3.1
4-6 years	28	28.6
6-8 years	11	11.2
More than 8 years	49	50.0
Years of experience in Chinese restaurants (*n* = 97)		
Less than 1 year	7	7.2
1-3 years	13	13.4
4-6 years	20	20.6
6-8 years	12	12.4
More than 8 years	45	46.4
Hours worked per week (*n* = 98)		
Less than 20 hours	4	4.1
20-40 hours	30	30.6
Over 40 hours	64	65.3
Job area (*n* = 98)		
Food preparation	46	23.3
Service	66	34.2
Dish room	16	7.9
Facility Clean-up	19	9.4
Non-food contact (office/cashier/etc.)	44	23.8
Other	14	1.5

Table 4.1 continued

Category	*n*	%
Family history of food allergy (*n* = 96)		
Yes	18	18.8
No	78	81.3
Type of foodservice operation (*n* = 97)		
Fast food	6	6.2
Takeout and delivery	30	30.9
Casual full-service	35	36.1
Fine dining full-service	26	26.8
Received food safety certification (*n* = 97)		
Yes	68	70.1
No	29	29.9
Type of food safety certification (*n* = 58)		
ServSafe®	52	89.7
National Environmental Health Association (NEHA)	3	5.2
Other	3	5.2
Received food allergy training (*n* = 98)		
Yes	32	32.7
No	66	67.3
Type of food allergy training (*n* = 30)		
ServSafe® Allergen	6	20.0
Part of food safety training	11	36.7
On the job	7	23.3
Previous workplace	3	10.0
Other	3	10.0
Food allergy customers (*n* = 95)		
Yes	54	56.8
No	41	43.2
Frequency of food allergy customers per year (*n* = 74)		
Rarely (4 or fewer customers)	21	28.4
Occasionally (5-8 customers)	15	20.3
Often (9-12 customers)	11	14.9
Frequently (more than 12 customers)	27	36.5
Frequency of food allergen		
Soy	21	
Milk	16	
Tree nuts	21	
Peanuts	65	
Seafood	37	
Fish	6	
Wheat	27	
Eggs	18	
Other[a]	18	

Table 4.2 Food allergy knowledge of respondents

Knowledge Items	*n*	%
1. Which of the following is not considered a major food allergen? (*n* = 98)		
a) Fruit	**80**	**82.5**
b) Wheat	10	10.3
c) Soy	4	4.1
d) Shellfish	3	3.1
2. Which body system can be affected by a food allergy reaction? (n = 96)		
a) Gastrointestinal tract	16	16.7
b) Respiratory system	12	12.5
c) Skin	7	7.3
d) All of the above	**61**	**63.5**
3. How soon does a food allergy reaction occur after the food is consumed? (n = 97)		
a) Immediately or within a few hours after the food is consumed.	**79**	**81.4**
b) Twenty-four hours after the food is consumed.	16	16.5
c) Thirty-six hours after the food is consumed.	1	1.0
d) Forty-eight hours after the food is consumed.	1	1.0
4. Which of the following is the best treatment for controlling a severe food allergic reaction? (n = 69)		
a) Benadryl™	39	56.5
b) Pseudoephedrine	2	2.9
c) Epinephrine	**21**	**30.4**
d) Aspirin	7	10.1
5. When preparing or serving a meal for a person with a food allergy, it is important to: (n = 97)		
a) Discuss the meal with the customer with food allergy.	19	19.6
b) Check ingredient labels of foods used to make the meal.	9	9.3
c) Deliver the food allergens safe meal to the customer separately.	9	9.3
d) All of the above.	**60**	**61.9**
6. Which of the following practices could cause cross-contact? (n = 95)		
a) Using the same cooking surfaces to prepare allergen-free foods as allergen-containing foods.	6	6.3
b) Cooking allergen-free food in the same cooking equipment as allergen-containing foods.	5	5.3
c) Not washing hands before handling the allergen-free food.	10	10.5
d) All of the above.	**74**	**77.9**
7. How much of a food allergen is safe for a food allergic person to eat? (n = 96)		
a) Small amounts are safe.	7	7.3
b) None.	**66**	**68.8**
c) Varies with the food.	14	14.6
d) Depends on how the food was prepared.	9	9.4
8. If a customer is experiencing an allergic reaction, what is the best first response? (n = 96)		
a) Determine what caused the reaction.	20	20.8
b) Call for medical help.	**63**	**65.6**
c) Find the customer's epinephrine and administer the medication.	13	13.5
d) Fire the person responsible for making the food that caused the reaction.	0	0
9. Why can fried foods be dangerous for individuals with food allergy? (n = 86)		
a) The high fat content in fried foods makes allergic reactions worse.	11	12.8
b) Frying changes the chemical structure of foods.	13	15.1
c) Cross-contact with food allergens can occur if the oil was used to cook allergen containing foods.	**60**	**69.8**
d) The high starch content makes allergic reactions worse.	2	2.3
10. Which of the following items are risky for food-allergic customers? (n = 92)		
a) Menu items with many ingredients.	24	26.1
b) Desserts.	5	5.4
c) Sauce-covered foods.	16	17.4
d) All of the above.	**47**	**51.1**

Table 4.2 continued

Knowledge Items	*n*	%
11. What are some of the symptoms of an allergic reaction? (n = 93)		
a) Sneezing, dizziness, muscle pain, headache.	6	6.5
b) Wheezing, facial swelling, abdominal cramps, vomiting.	**80**	**86.0**
c) Constipation, bloating, gas, heartburn.	7	7.5
d) Lack of energy, backache, depression, anxiety.	0	0
12. Where can you find whether an ingredient you are using contains an allergen? (n = 95)		
a) Looking on the manufacturer's website.	1	1.1
b) By asking a manager.	7	7.4
c) Reading the ingredient label.	**44**	**46.3**
d) The customer should know what foods they cannot eat.	43	45.3

Note. Bolded items are the correct answers.

Table 4.3 Questionnaire participants' attitude scores

Attitude Statement (α = 0.89)	*M*[a]	*SD*	*n*(%) Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Attitude Total	3.62	1.47					
It is important to me that accurate information about food ingredients is provided to customers. (*n* = 97)	4.13	0.79	1(1)	1(1)	15(15.5)	47(48.5)	33(34)
I believe that providing customers with food allergy information will decrease the likelihood of a food allergic reaction. (*n* = 98)	4.01	0.79	1(1)	2(2)	18(18.4)	51(52)	26(26.5)
I am willing to change my food handling behaviors related to handling food allergens. (*n* = 98)	4.00	0.81	1(1)	4(4.1)	15(15.5)	47(48.5)	33(34)
I think preventing food allergy reaction is an important part of my job responsibilities. (*n* = 98)	3.96	0.94	1(1)	4(4.1)	27(27.6)	32(32.7)	34(34.7)
My workplace should refuse to serve people with food allergy.[b] (*n* = 98)	3.90	0.91	1(1)	7(7.1)	19(19.4)	45(45.9)	26(26.5)
Serving a customer with food allergy is not worth the potential liability.[b] (*n* = 98)	3.84	0.83	1(1)	4(4)	25(25.3)	49(49.5)	20(20.2)
A person with food allergy should not be eating in restaurants.[b] (*n* = 97)	3.82	0.84	0(0)	8(8.2)	20(20.6)	50(51.5)	19(19.6)
Food allergy customers are just picky eaters.[b] (*n* = 98)	3.79	1.03	4(4.1)	6(6.1)	22(22.4)	41(41.8)	25(25.5)
Food allergy training is not a good use of my time.[b] (*n* = 98)	3.79	0.85	1(1)	4(4.1)	30(30.6)	43(43.9)	20(20.4)
Learning about food allergy is important to me. (*n* = 97)	3.72	0.90	1(1)	9(9.3)	23(23.7)	47(48.5)	17(17.5)
Food allergy is a serious health issue. (*n* = 98)	3.70	0.85	1(1)	5(5.1)	33(33.7)	42(42.9)	17(17.3)
I am willing to attend training courses/workshops to learn more about food allergy. (*n* = 98)	3.65	0.75	0(0)	4(4.1)	38(38.8)	44(44.9)	12(12.2)
Food allergy training is not useful to me.[b] (*n* = 98)	3.63	0.98	3(3.1)	8(8.2)	29(29.6)	40(40.8)	18(18.4)
I think my workplace is responsible for educating me about food allergy and allergen handling. (*n* = 98)	3.56	0.77	1(1)	4(4.1)	42(42.9)	41(41.8)	10(10.2)
I cannot guarantee a food allergen safe meal.[b] (*n* = 95)	3.32	0.89	3(3.2)	11(11.6)	41(43.2)	33(34.7)	7(7.4)
I believe it is entirely the customers' responsibility to avoid food allergens.[b] (*n* = 97)	2.70	1.05	13(13.4)	28(28.9)	36(37.1)	15(15.5)	5(5.2)

[a]5-point Likert scale used (1 = *Strongly disagree*; 5 = *Strongly agree*) [b]Items were reverse coded

Table 4.4 Questionnaire participants' practice scores

Practice Statement (α = 0.88)	*M*[a]	*SD*	*n*(%) Never	Rarely	Sometimes	Often	Always
Practice Total	4.29	0.64					
Kitchen Staff (*n* = 65-72)	4.27	0.68					
I prepare allergen-containing and allergen-free dishes separately. (*n* = 70)	4.14	1.17	3(4.3)	5(7.1)	10(14.3)	13(18.6)	39(55.7)
I told staff members a dish did not contain any allergens when I was unsure.[b] (*n* = 70)	4.26	1.26	5(7.1)	4(5.7)	6(8.6)	8(11.4)	47(67.1)
I use clean and sanitized cooking equipment to prevent cross-contact. (*n* = 71)	4.37	1.00	2(2.8)	3(4.2)	6(8.5)	16(22.5)	44(62)
I read labels of ingredients when preparing food for a customer with a food allergy. (*n* = 72)	4.11	1.15	3(4.2)	6(8.3)	7(9.7)	20(27.8)	36(50)
When a customer with a food allergy comes in, I know exactly what to do. (*n* = 70)	4.49	0.79	1(1)	0(0)	7(10)	18(25.7)	44(62.9)
My workplace has told me what I should do when someone tells me they have a food allergy. (*n* = 65)	4.12	1.22	4(6.2)	5(7.7)	5(7.7)	16(24.6)	35(53.8)
I communicate with other staff members to ensure an allergy safe meal is prepared. (*n* = 68)	4.50	0.84	1(1.5)	1(1.5)	6(8.8)	15(22.1)	45(66.2)
Service Staff and Managers (*n* = 67-79)	4.33	0.66					
I serve allergen-containing and allergen-free plates separately. (*n* = 75)	4.40	0.97	1 1.3)	4(5.3)	8(10.7)	13(17.3)	49(65.3)
I told customers a dish did not contain any allergens when I was unsure.[b] (*n* = 78)	4.23	1.34	8(10.3)	1(1.3)	11(14.1)	3(3.8)	55(70.5)
I wash my hands before serving customers with food allergy their food. (*n* = 77)	4.14	1.11	3(3.9)	4(5.2)	12(15.6)	18(23.4)	40(51.9)
I provide accurate information to customers regarding a dish's ingredients. (*n* = 79)	4.51	0.83	0(0)	4(5.1)	5(6.3)	17(21.5)	53(67.1)
When a customer with a food allergy comes in, I know exactly what to do. (*n* = 76)	4.37	0.89	2(2.6)	0(0)	9(11.8)	22(28.9)	43(56.6)
My workplace has told me what I should do when someone tells me they have a food allergy. (*n* = 67)	4.22	1.17	4(6)	2(3)	9(13.4)	12(17.9)	40(59.7)
I communicate with other staff members to ensure an allergy safe meal is prepared. (*n* = 76)	4.61	0.77	0(0)	3(3.9)	4(5.3)	13(17.1)	56(73.7)

[a]5-point Likert scale used (1 = Never; 5 = *Always*) [b]Items were reverse coded.

Table 4.5 Questionnaire participants' food allergy training (n = 32)

Received Training Items	Yes n(%)	No n(%)
I have received training to identify the major food allergens.	30(93.8)	2(6.3)
I have received training on how to read food labels for food allergen identification.	29(90.6)	3(9.4)
I have received training on how to avoid cross-contact between foods during food preparation or service.	30(93.8)	2(6.3)
I have received training on how to communicate allergen information to customers.	30(93.8)	2(6.3)
I have received training on how to handle an allergic reaction.	23(71.9)	9(28.1)

Table 4.6 Perceived need of food allergy training (n = 32)

Training Item	M[a]	SD[b]	n(%) Very unnecessary	Somewhat unnecessary	Neither necessary or unnecessary	Somewhat necessary	Very Necessary
Training about food allergy.	4.53	1.19	3(9.4)	3(9.4)	0(0)	0(0)	26(81.3)
Training to identify major food allergens.	4.50	1.19	3(9.4)	0(0)	0(0)	4(12.5)	25(78.1)
Training on how to read ingredient labels for food allergen.	4.50	1.19	3(9.4)	0(0)	0(0)	4(12.5)	25(78.1)
Training on how to avoid cross-contact between foods during food preparation/service.	4.56	0.95	0(0)	3(9.4)	1(3.1)	3(9.4)	25(78.1)
Training on how to communicate with customers about allergens.	4.53	0.92	0(0)	3(9.4)	0(0)	6(18.8)	23(71.9)
Training on how to handle an allergic reaction.	4.41	1.27	3(9.4)	1(3.1)	0(0)	4(12.5)	24(75)

[a]5-point Likert scale used (1 = *very unnecessary*; 5 = *very necessary*)

Table 4.7 Participant mean knowledge, attitude, and practice scores with and without food allergy specific training or food safety certification

	Knowledge		Attitude		Practices	
	M	SD	M	SD	M	SD
Food Allergy Training (n = 98)						
Yes	8.91	2.26	3.79	0.47	4.60	0.48
No	6.82	2.83	3.53	0.44	4.13	0.66
Food Safety Certification (n = 95)						
Yes	8.34	2.47	3.69	0.43	4.45	0.51
No	5.89	2.91	3.46	0.51	3.89	0.77

Table 4.8 Correlations of food allergy knowledge, attitude, practice, certifications, trainings, English fluency and education (n = 98)

		Practice Score	Attitude Score	Knowledge Score	Food Safety Certification	Food Allergy Training	English Fluency	Level of Education Completed	Foodservice Experience	Chinese Foodservice Experience	Employee Work Status
Practice Score	Correlation	1	**0.398***	**0.316***	**0.393***	**0.342***	0.176	0.111	**0.202***	0.153	-0.025
	Sig. (2-tailed)		**0.000**	**0.002**	**0.000**	**0.001**	0.090	0.281	**0.048**	0.138	0.810
Attitude Score	Correlation	**0.398***	1	**0.380***	**0.231***	**0.263***	0.033	0.105	0.030	-0.017	-0.026
	Sig. (2-tailed)	**0.000**		**0.000**	**0.023**	**0.009**	0.752	0.303	0.771	0.867	0.796
Knowledge Score	Correlation	**0.316***	**0.380***	1	**0.391***	**0.349***	0.175	**0.271***	-0.058	-0.118	0.000
	Sig. (2-tailed)	**0.002**	**0.000**		**0.000**	**0.000**	0.087	**0.007**	0.568	0.249	1.000
Food Safety Certification	Correlation	**0.393***	**0.231***	**0.391***	1	**0.362***	0.157	0.170	**0.215***	0.141	0.077
	Sig. (2-tailed)	**0.000**	**0.023**	**0.000**		**0.000**	0.127	0.097	**0.034**	0.170	0.451
Food Allergy Training	Correlation	**0.342***	**0.263***	**0.349***	**0.362***	1	0.101	-0.114	-0.001	-0.045	-0.138
	Sig. (2-tailed)	**0.001**	**0.009**	**0.000**	**0.000**		0.326	0.264	0.994	0.663	0.174
English Fluency	Correlation	0.176	0.033	0.175	0.157	0.101	1	**0.325***	0.015	-0.044	0.133
	Sig. (2-tailed)	0.090	0.752	0.087	0.127	0.326		**0.001**	0.883	0.670	0.195
Level of Education Completed	Correlation	0.111	0.105	**0.271***	0.170	-0.114	**0.325***	1	0.072	0.010	0.190
	Sig. (2-tailed)	0.281	0.303	**0.007**	0.097	0.264	**0.001**		0.479	0.920	0.061
Foodservice Experience	Correlation	**0.202***	0.030	-0.058	**0.215***	-0.001	0.015	0.072	1	**0.941***	**0.358***
	Sig. (2-tailed)	**0.048**	0.771	0.568	**0.034**	0.994	0.883	0.479		**0.000**	**0.000**
Chinese Foodservice Experience	Correlation	0.153	-0.017	-0.118	0.141	-0.045	-0.044	0.010	**0.941***	1	**0.362***
	Sig. (2-tailed)	0.138	0.867	0.249	0.170	0.663	0.670	0.920	**0.000**		**0.000**
Employee Work Status	Correlation	-0.025	-0.026	0.000	0.077	-0.138	0.133	0.190	**0.358***	**0.362***	1
	Sig. (2-tailed)	0.810	0.796	1.000	0.451	0.174	0.195	0.061	**0.000**	**0.000**	

*Correlation is significant at the 0.05 level (2-tailed).

Table 4.9 Regression Analysis Summary (n = 93)

R	R^2	Adjusted R^2	df1	df2	F	Sig.
0.505[b]	0.255	0.239	2	92	15.751	0.000

[a] Dependent Variable: Practice Total
[b] Predictors: (Constant), Attitude Total, FS Certification

Table 4.10 Participants' preferred format for a food allergy training program (n = 31)

Format	*n*
Booklet/poster/flyer	24
Lecture/seminar/class/presentation	16
Online class	11
Mobile application	4

CHAPTER 5. FOOD ALLERGEN REFERENCE RESOURCE CREATION FOR PACKAGED FOODS IN CHINESE RESTAURANTS

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Abstract

The purpose of this study was to create a food allergy reference resource to identify food allergens in commonly used Chinese restaurant packaged foods to create an initial reference database. Commonly used packaged foods in Chinese restaurants were identified and their ingredient labels collected for analysis for major allergens, adherence to Food Allergen Labeling and Consumer Protection Act labeling regulations, and, use of voluntary allergen advisories. Analyzed data was used in the creation of a food allergen reference resource of packaged Chinese restaurant ingredients to extend the knowledge of allergens commonly found in Chinese restaurants.

Keywords: food allergy, foodservice, Chinese restaurants, ethnic food, training resources

Introduction

Global prevalence of food allergy is on the rise affecting up to ten percent of the world's population (Sicherer & Sampson, 2018). Depending on the severity of an individual's condition, contact or consumption of any amount of a triggering allergen can result in a reaction (Sicherer & Sampson, 2018). There is currently no cure for food allergy meaning management of the condition involves the meticulous avoidance of the allergen to prevent reaction (Sicherer & Sampson, 2018).

Meals consumed away from home, such as in restaurants, are particularly challenging for individuals with food allergy due to hard-to-identify or recognize allergens in foods or ingredients, commonly referred to as hidden allergens (Kwon & Lee, 2012; Weiss & Munoz-Furlong, 2008). Ingestion of a hidden allergen in restaurants most commonly occurs because of the inaccurate communication of information by staff regarding the ingredients of a dish to a customer (Anibarro, Seoane, & Mugica, 2007; Weiss & Munoz-Furlong, 2008). Nearly a quarter (22.4%) of food allergy reactions in restaurants are caused by the consumption of hidden allergens; 32% of those reactions were found to be severe, life-threatening reactions (Anibarro et al., 2007; Vierk, Koehler, Fein, & Street, 2007). Thus, the careful reading of ingredient labels is recommended for anyone involved in the purchasing, preparing, or serving of food to allergic customers to reduce accidental exposure to allergens (Dupuis et al., 2016; Sheth et al., 2010; Food & Drug Administration [FDA], 2018; Weiss & Munoz-Furlong, 2008).

Previous research has found Chinese restaurants are particularly challenging for individuals with food allergy due to hidden allergens in menu items with pre-prepared foods and multiple unfamiliar ingredients (Kwon & Lee, 2012). Further compounding the

challenges for individuals with food allergy in Chinese restaurants is the lack of food allergy knowledge and training among foodservice professionals in Chinese restaurants, particularly with regards to the reading of food labels (Kwon & Lee, 2012; Lee & Xu, 2015; Sicherer et al., 2012).

Food allergy training is voluntary for many foodservice professionals and laws requiring food allergy training are focused on foodservice managers, leaving food allergy training for staff primarily in the hands of their managers (Bailey, Kindratt, Smith & Reading, 2014). Furthermore, food allergy training programs and materials are limited and in need of further development, particularly as it relates to ethnically specific foods, giving foodservice professionals few resources to learn more about food allergy (Kwon & Lee, 2012; Lee & Xu, 2015). Thus, extending the knowledge surrounding food allergens in packaged Chinese food products by creating a database of information regarding food allergen in packaged foods may help the development of future training programs by providing a greater variety of resources to inform the programs developed.

Literature Review

The labeling of major allergenic foods has been legally mandated in several countries, including the U.S., Canada, the European Union, Korea, and Japan, to assist consumers in distinguishing food allergens (Fierro, Di Girolamo, Marzano, Dahdah, & Mennini, 2017; Park et al., 2016). However, research has revealed that consumers and foodservice employees find labels confusing and easily misunderstood (Fierro et al., 2017; Park et al., 2016; Simons, Weiss, Furlong, & Sicherer, 2005; Vierk et al., 2007). In a study of ingredient label use among consumers for food allergy management, respondents reported issues regarding unfamiliar, overly technical or difficult to

understand food terms, as well as issues around new or changed ingredients (Sheth et al., 2010; Vierk et al., 2007).

To assist with the identification of allergens in the United States, the Food Allergen Labeling and Consumer Protection Act (FALCPA) requires packaged food products that contain an ingredient that is, or contains the allergenic protein from, one of the eight major food allergens to declare its presence on the label (FDA, 2018). The labelling requirement mandates that manufacturers use the commonly known name of an allergen to call attention to its presence in the packaged food, either by identifying the allergen in the ingredient list or in a separate "Contains" statement immediately following the list of ingredients (FDA, 2018), as detailed in Table 5.1. Currently, FALCPA focuses on the U.S. Food and Drug Administration's (FDA) major food allergens: wheat, milk, eggs, fish, crustacean shellfish, peanuts, tree nuts, and soy, which account for over 90% of all documented food allergies in the U.S. and are most commonly associated with severe or life-threatening allergic reactions (FDA, 2018). Sesame (and other) seeds are not considered major allergens and do not fall under the allergen categories of peanuts (considered legumes) or tree nuts (which include walnuts, almonds, hazelnuts, cashews, Brazil nuts, etc.) (FDA, 2018). Molluscan shellfish such as oysters, mussels, clams, and scallops are also not considered major food allergens and therefore are not required to be included in allergen labelling (FDA, 2018).

FALCPA's labeling requirements only extend to foods regulated by the FDA; thus, U.S. Department of Agriculture (USDA) and Alcohol and Tobacco Tax and Trade Bureau regulated food products, as well as foods consumed in restaurants, bakeries, or takeout restaurants are not required to include cautionary labelling regarding food

allergens (FDA, 2018). While FALCPA has improved identification of allergens on FDA-administered packaged foods, the accidental ingestion of food allergens continues be a challenge for individuals with food allergy when dining at restaurants where the responsibility of reading and understanding ingredient labels is shared with foodservice employees.

Allergen Advisory Statements

In addition to the FALCPA labeling, products may also choose to include allergen advisory statements on their labels. Allergy advisory statements (also referred to as precautionary labels) were created to inform consumers about possible trace amounts of a specific allergen in the food because of cross-contact during the manufacturing process with the intent to increase consumer safety and reduce future potential legal problems (Fierro et al., 2017; Verrill & Choinière, 2009; Voordouw et al., 2012; Voordouw et al., 2009). As allergen advisory statements are voluntary, the FDA does not regulate the use and accuracy of these statements, leaving it up to industry and individual manufacturers (Fierro et al., 2017; Verrill & Choinière, 2009). This lack of oversight has left statement use inconsistent across products with no standardization of use, formatting, or application, resulting in a variation of allergen advisory statements (Table 5.2) (Allen et al., 2014; DunnGalvin et al., 2015; Fierro et al., 2017; Verrill & Choinière, 2009). These discrepancies have led to confusion for consumers who are often unaware of the statements' voluntary use and lack of formal oversight, causing feelings of stress and insecurity when trying to select allergen safe foods for consumption (Allen et al., 2014; DunnGalvin et al., 2015; Fierro et al., 2017; Pieretti et al., 2009; Verrill & Choinière, 2009).

FALCPA has helped simplify allergy management for food allergic individuals and has helped to reduce incidence associated with hidden allergens, however, understanding how to read food labels for allergen is a fundamental part of reducing allergic reaction (Ajala et al., 2010; Sheth et al., 2010). Previous research reports foodservice professionals' knowledge and training regarding food allergy to be particularly lacking with regards to the reading of food labels for food allergy, which is considered critical knowledge for those involved in the handling of food for individuals with food allergy to reduce accidental exposure (Ajala et al., 2010; Sheth et al., 2010).

In addition to the problem of reading and understanding food allergen labels is the issue of inconsistent food allergen labeling. An audit of product label adherence to FALCPA regulations by Pieretti, Chung, Pacenza, Slotkin, and Sicherer (2009) reported violations and inconsistencies, finding six labels (N = 744) in violation of FALCPA labeling requirements, several (n = 25) allergy advisory statement variations on packaged food product labels, and ambiguities on labels regarding ingredient sources. For foodservice professionals that may not have adequate knowledge and training regarding the use of food allergen labeling, inaccurate or confusing labels may be creating an additional barrier in the safe preparation of allergen free meals by individuals with food allergy, their caretakers, and foodservice professionals.

Chinese restaurants have been identified as a common site of allergic reactions with hidden allergens, cross-contact, and communication issues as reported possible causes (Leftwich et al., 2011). Individuals with food allergies have said they find Chinese restaurants to be places of high risk of reaction due to the cuisine's unfamiliar ingredients, hidden allergens in sauces or manufactured ingredients, and

miscommunication with staff (Kwon & Lee, 2012; Leftwich et al., 2011). The difficult to identify ingredients in Chinese dishes and use of premade sauces and manufactured food ingredients make the accurate identification of food allergens complicated, as premade sauces can contain multiple allergens from manufactured ingredients that can contain derivatives of milk, egg, and soy proteins, which may not always be clearly identified on labels (Kwon & Lee, 2012). Additionally, individuals with food allergy have noted that Chinese restaurants may use certain practices, such as the blending of shrimp into dishes for flavor or texture, that might not be reflected on menu descriptions but can cause allergy reaction (Kwon & Lee, 2012).

Food safety training research has found that training can have a significant impact on improving food safety knowledge and behaviors for foodservice employees (Roberts et al., 2008), and, in the case of ethnic foods, training would be enhanced for foodservice employees if programs included tools that were culturally appropriate to ethnic foods and ethnic food practices (Mauer et al., 2006). Despite these identified benefits to developing culturally appropriate tools for ethnic foods the need for improved resources surrounding ethnic food safety information and food safety resources focusing specifically on ethnic foods for food safety professionals and has not been met (Mauer et al., 2006). As such, developing a reference resource, or database, of information regarding the allergens present in packaged foods found in Chinese restaurants may help to improve the variety of resources available to food allergy training developers and may eventually assist in the diversification and increased cultural sensitivity of food allergen training resources.

Therefore, the purpose of this research was to create a major allergen reference resource as the start of a database to assist in the identification of major allergens in

packaged foods and to potentially provide content for possible inclusion in future food allergy training. In support of the creation of this ethnically-specific reference resource, ingredient labels of commonly used ingredients in Chinese restaurants were assessed for major allergens, adherence to FALCPA labeling requirements, and use of allergen advisory statements.

Methods

Study Sample

A random sample of 25 food distributors were invited to participate in the study from an aggregate list of food distributors complied from the International Foodservice Distributors Association and an online search of Asian foodservice distributors. The distributors were contacted via email or online contact form with a letter detailing the study's purpose and confidentiality terms, as well as requesting a product list of packaged food items frequently purchased by Chinese restaurants (Appendix K); three weekly follow-up emails were also sent to the sample.

Seven distributors contributed product lists for the study which were combined into one product list from which the 20 most frequently found packaged food categories were identified and then the five most frequently appearing items within each category were identified and selected, resulting in a sample size of 99 products.

Data Collection

To collect the necessary label information, the PI visited restaurant wholesale warehouses and manufacturers' websites and collected the full text of samples' ingredient label, focusing specifically on the ingredient list and any allergen labelling and/or voluntary allergy advisories.

Data Analysis

Allergen Term List. A list of allergen terms and products containing major allergens was needed for data analysis to assess whether any of the sample items contained ingredients containing allergens or processed ingredients derived from allergens. Therefore, a list of major allergen ingredients and associated derivative products was compiled from Food Allergy Resource & Education [FARE] (2018), the Asthma and Allergy Foundation of America [AAFA] (2018), and the Consortium of Food Allergy Research [CFAR] (2018). The compiled Allergen Term List included 729 ingredients containing major allergens and ingredients that may—or could potentially—contain major allergens, posing a potential allergen hazard; the difference between a definite hazard and a potential hazard was noted on the list (Appendix L).

Analysis. The data collected was evaluated for major allergens, adherence to FALCPA labeling guidelines, and allergen advisory statements, if any. To identify major allergens, the study sample's ingredient lists were compared against the complied Allergen Term List to determine if the packaged food contained any major allergens or their derivative ingredients. Items found to contain or possibly contain a major food allergen were noted and marked according to whether the food contained or could possibly contain the allergen.

FALCPA requires major allergens in packaged food products to be listed in the ingredient list by a common or usual name, or in the case of processed ingredients containing or derived from an allergen to include the major allergen (FDA, 2018), such as including "soy" when listing lecithin derived from soy, as seen in Table 5.1. Therefore, product labels were also analyzed to determine whether they compiled with either of the

required FALCPA allergen identification formats, namely whether a product label used an allergen's common name in the ingredient list, used a 'Contains' statement immediately following the ingredients list, or both, was noted. Statements that did not use the term "Contains", as set forth in the FALCPA labeling guidelines (FDA, 2018), were marked as an allergy advisory and not counted as an allergen declaration. Voluntary allergen advisories were also examined for format and phrasing. Examples of the data collected can be seen in Figure 5.1.

Frequencies were calculated to determine the most commonly appearing allergen in frequently purchased packaged foods in Chinese restaurants. Descriptive statistics were calculated to determine the rate of FALCPA requirement compliance of packaged foods in Chinese restaurants.

Reference Creation

The analyzed data were used to create a reference resource of Chinese restaurants packaged foods using the sample's brands, individual product names, ingredient list, allergen declarations, and allergen advisories, if any. The final reference material was tabulated and organized by product category, then brand, then item name for ease of reference (Appendix M).

Results

A total of seven distributors contributed product lists to the study. The 20 most commonly appearing product categories from the aggregate list were identified as: batter mix, ready to cook (RTC) chicken, oil/shortening, RTC crab rangoon, duck sauce, RTC potstickers, RTC egg roll, fish sauce, General Tso's Sauce, hoisin sauce, Orange Sauce, oyster sauce, plum sauce, RTC pork, soy sauce, Stir-Fry Sauce, imitation crab, Sweet and

Sour Sauce, and, premade wrappers (Table 5.3). For the purposes of this study, the primary investigator excluded single-ingredient products, such as cornstarch and sesame seed oil, from the analysis.

From the final 20 product categories, the five most commonly appearing packaged food items were selected for analysis whenever possible, however as RTC pork had only four commonly appearing products, the final sample size was 99 packaged foods ingredient labels. Of the 99 product labels analyzed for a major food allergen, 15 were found to be free of major allergens. Among the remaining 84 items, wheat was the most frequently appearing food allergen (n = 71), followed by soy (n = 53), egg (n = 31), fish (n = 15), milk (n = 14), and shellfish (n = 7) (Table 5.4). No sample items were found to include peanut or tree nut allergens or its derivative products.

The product category with the highest mean number of major food allergens (M = 5) with soy, wheat, and milk commonly found in the products was RTC crab rangoon (Table 5.5). Imitation crab was also found to have a high mean number of major food allergens (M = 4) and frequently contained egg and fish allergens. Duck and plum sauce product categories had the lowest mean number of major food allergens listed in the ingredients; only one item in each product category contained any major food allergens.

Per FALCPA guidelines, products containing major allergens must list the allergen item in common terms in the ingredient list, use a “Contains” statement, or both. Most (n = 56, 56.6%) of the sample’s product labels elected to include common terms in the ingredient list and a “Contains” statement following the product’s ingredient list, 41 product ingredient labels (41.4%) elected to use only common terms in the ingredients list.

Product labels' use of common terms in the ingredient list are permitted by FALCPA to appear in two formats. The first format includes the common name of the major food allergen in parenthesis following the ingredient; the second is to list the major food allergen in the list of ingredients by the common name when the name of the major allergen does not appear elsewhere in the ingredient statement (FDA, 2018). Nearly 60% (n = 59) of the sample used the parentheses format to include the common name of the major food allergen on the list, while 26.3% (n = 26) included the common names of the major food allergens within the ingredient list. Among the ingredient labels that used a "Contains" declaration, one item listed two foods not included in the FDA's major allergens: barley and sesame seeds. It is unclear whether including non-major allergens in with FALCPA labelling requirements is a violation of the regulation.

Several products also included ingredients that were noted to be potential hazards of a major food allergen, as identified when analyzing the product ingredient labels against the allergen ingredients list. Caramel, a potential hazard for milk allergen, was listed as an ingredient in four products. Similarly, "caramel coloring" was included in the ingredient lists for 21 different items and has been found to be a potential hazard for wheat allergen. The ambiguous term "natural flavors" appeared on 23 product ingredient labels. Two products specified the source of natural flavors (one crab and one milk) while 21 did not disclose the source of the natural flavors which can pose potential hazards for egg, milk, peanut, soy, tree nuts, and wheat (AAFA, 2018).

In addition to the FALCPA labeling requirements, four of the product ingredient labels included voluntary Allergen Advisory statements. One item, Iron Chef™ Brand General Tso's Sauce & Glaze, met FALCPA labeling requirements and included an

allergen advisory stating “Produced in a facility that processes tree nuts. Manufactured in a peanut free facility.” A second item (Teriyaki Sauce) from the same brand (Iron Chef™) noted “Produced in a facility that is peanut and tree nut free.” One of the Allergen Advisory statements in the sample noted the possible presence of Crustacean Shellfish, noting the product “May Contain: Crustacean Shellfish (Snow Crab)”, while the last item with an advisory stated “Allergen: Wheat.”

The food allergen reference list for commonly used Chinese restaurant products (Appendix M) created as part of this study includes the product’s brand, product name, ingredient list, the major allergens identified in the ingredient list and the potential allergens that may also exist in the product based on ambiguous labeling.

Discussion

The purpose of this research was to provide a possible reference resource of allergens found in commonly found packaged foods in Chinese restaurants. As part of the creation of this reference resource, this study assessed ingredient labels of commonly used ingredients in Chinese restaurants adherence to FALCPA labeling requirements and use of allergen advisory statements.

Past researchers have indicated that Chinese restaurants’ frequent use of premade sauces and manufactured food ingredients can complicate the identification of food allergens and increase the likelihood of the accidental consumption of hidden allergens given the multiple ingredients contained therein (Kwon & Lee, 2012; Leftwich et al., 2011). The findings of this study supported this earlier research as five product categories were pre-made, ready-to-use sauces (i.e. General Tso’s Sauce, Orange Sauce, Stir-Fry Sauce, Sweet & Sour Sauce, Teriyaki Sauce) and five products were RTC items (RTC

chicken, RTC crab rangoon, RTC potstickers, RTC egg roll, RTC pork). RTC crab rangoon had the greatest mean number of food allergens (M = 5) across the five products, followed closely by imitation crab (M = 4), another highly processed food.

Wheat and soy were the most frequently noted allergens identified in the ingredient labels appearing in over half of the products (71.7% and 53.5%, respectively). Research into customers' concerns regarding food allergens in Chinese restaurants previously reported concerns about peanut and tree nut products in foods (Leftwich et al., 2011). Although this study's findings do not support customers' concerns about the prevalence of peanut and tree nuts in Chinese restaurants reported in past research, the potential hazard of peanut and tree nuts in Chinese foods is not negated by the findings of this study but rather suggest that the sources of peanut and tree nuts allergens may come from cross-contact during the cooking process. The results of this study suggest that customers with wheat and soy allergy should also be aware of the prevalence of those allergens which the data shows are also frequently found in Chinese restaurants foods.

All the product ingredient labels complied with FALCPA labeling requirements and provided allergen information in either or both accepted formats. However, the present study did not evaluate the accuracy of these statements with an analysis of the foods for the presences of allergens. Foodservice professionals rely on the accuracy of the ingredient labels, yet previous research surrounding allergen labeling and manufacturing facilities found approximately 20% of facilities did not check that labels were applied to the correct products during production and only about 75% of manufacturing facilities checked their labels for accuracy when they were received from outside sources (Gendel,

Khan, & Yajnik, 2013). Thus, while FALCPA compliance may be present, there may potentially be concerns regarding other areas of compliance and accuracy.

Labeling ambiguities were also a cause of concern with packaged products despite adherence to FALCPA regulations. The product labels reviewed in this study also revealed several products with ambiguous ingredients. Twenty-three products listed "natural flavors" which has been linked to egg, milk, peanut, soy, tree nut and wheat allergens as an ingredient; without further clarification, the ambiguity of these labels could be cause for concern for those searching for information regarding allergens (Pieretti et al., 2009). Complete, consistent, and accurate product labels are important for food allergen risk management as consumers with food allergy and foodservice professionals alike rely on them to identify products safe for consumption and any inaccuracies or inconsistencies can pose a significant threat of allergic incidence (Gendel et al., 2013; Hefle et al., 2007). Given that accidental ingestion of food allergens because of labeling ambiguities is a preventable risk, legislators may wish to revisit the label regulation to clarify rules surrounding ambiguous food items as they can unnecessarily pose a threat food allergic consumer.

Other inconsistencies among the FALCPA allergen declarations were also problematic. Past research reports consumers found multiple problems with food allergen labeling, such as the format of the allergen declaration and the varying locations of the allergen declaration between different products and different brands, all of which create confusion when searching for allergen information to prevent accidental consumption (Turner & Gowland, 2016; Voordouw et al., 2009). Within the current study's sample, label formatting varied with some products, e.g. some labels bolded allergen common

terms while some bolded the “Contains” statement. The location of ingredient labelling was inconsistent as products for foodservice often come in larger packaging than for retail and consumer use (i.e. five-gallon containers of soy sauce rather than 20 ounce bottles for retail), and may be sold in case packs that contain multiple containers (i.e. a box case of two five-pound packages of RTC crab rangoon); thus, locating the ingredient list and FALCPA labeling from the sample requires searching case pack boxes, individual product packages, or both. For busy foodservice professionals with minimal training regarding the reading and understanding of food allergy labels (Fierro et al., 2017; Park et al., 2016), difficulty in locating ingredient labels exacerbates the problems of reading and application.

Allergen advisories also contribute to confusion and complication in identifying allergens on packaged foods (Voordouw et al., 2009; Zurzolo et al., 2016). Commonly reported issues with these advisories are a lack of consistency and regulation, leaving it difficult for consumers to gauge the accuracy and reliability of the advisories (Voordouw et al., 2009; Zurzolo et al., 2016). The study’s sample included two products from the same brand (Iron Chef^{TM}) that used allergen advisory statements with different terms on both; on one, the product is “produced” in a facility that processes tree nuts and “manufactured” in a peanut free facility, on the second product, the product is “produced in a peanut and tree nut free facility”. The omission of a “manufactured” statement in the second product may cause concern or confusion for those looking to avoid a food allergen, and as past research has suggested, challenges the credibility of such statements when searching food labels for allergen information (Voordouw et al., 2009). Voordouw et al. (2009) previous suggested that allergen advisory labeling, such as “May contain”

statements, should only be used if the risk of cross-contact during the manufacturing process is proven significant via testing, but given the voluntary nature of the statements and the lack of regulatory agency, the issues are unlikely to be resolved without greater industry self-regulation.

As these findings support, food allergy labelling may not be presented on packaged foods in ways that are supportive of food allergen accommodation practices in foodservice. The results show they can be confusing, hard to understand, and difficult to locate. Efforts to improve food allergy knowledge and training, which includes the reading and understanding of allergen labels, have been challenging as food allergen training is largely voluntary for foodservice professionals (Bailey et al., 2014). Additionally, the lack of available training resources that include or cater towards culturally-specific ingredients and cooking methods can limit the training's efficacy or create issues of understanding and communication in the training process.

Chinese restaurants are particularly problematic for individuals with food allergy given the difficulty customers often face with the identification of allergens due to unfamiliar ingredients, the use of packaged and premade foods, and menu items with multiple ingredients (Kwon & Lee, 2012; Leftwich et al., 2011; Pumphrey & Gowland, 2007). Thus, the creation of a food allergen database to extend the knowledge of food allergens in packaged foods found in Chinese restaurants could be helpful in clarifying confusion and creating a resource for future reference, and potential inclusion in future food allergy trainings specific to Chinese restaurant employees, possibly to one day lower the allergy incidence rate in these foodservice operations.

Limitations and Future Research

The purpose of this study was to create a food allergen reference resource of packaged foods in Chinese restaurants. Past research on food allergy labeling on products has been primarily focused on improving consumers' abilities to distinguish foods containing allergens to follow the prescribed avoidance diet for individuals with food allergies.

The study has some limitations. First, Chinese restaurants are not a homogenous group with several hundred thousand foodservice operations offering a variety of Chinese menu items, types of ingredients and preferred brands vary from operation to operation and from operator to operator. The sample size of products for this study was small and only reflects a small portion of the vast number of packaged foods available and in use in Chinese restaurants. Therefore, while this reference guide can start to begin to address the training and reference resources needs for Chinese restaurant foods, it is limited in its scope.

The foodservice distributors in this study were large distributors; however, small commercial foodservice operations such as Chinese restaurants may not rely solely on large distributors, and purchase items from smaller, culturally-specific distributors in their area. Therefore, the products included in this research may not reflect the most frequently used ingredients across all Chinese restaurants.

Future research may wish to investigate packaged foods most frequently used or purchased by Chinese restaurants as reported by employees of Chinese restaurants, or to identify where Chinese restaurants primarily source their ingredients from, to further develop the reference material begun by this research. Additionally, future research may

wish to explore how to develop food allergen reference materials for employees of other culturally-specific cuisines or generally for the diverse language needs of the foodservice industry's workforce.

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Table 5.1 Food Allergen Labeling and Consumer Protection Act (FALCPA) labeling requirement options for food allergen declaration in packaged foods

Option One:	**INGREDIENTS:** Unbleached Enriched Flour (**Wheat** Flour, Niacin, Reduced Iron, Thiamine Mononitrate (Vitamin B1), Riboflavin (Vitamin B2), Folic Acid, Sugar, **Soybean** Oil, High Fructose Corn Syrup, Partially Hydrogenated Cottonseed Oil, Whey (From **Milk**), **Eggs**, Natural And Artificial Flavor, Salt, Leavening (Baking Soda And/Or Calcium Phosphate), Emulsifiers (Mono- And Diglycerides, **Soy** Lecithin).
Option Two:	**CONTAINS: WHEAT, MILK, EGG, SOY.**

Note: Sample ingredient list from Nabisco® brand Nilla Wafer box.

Table 5.2 Examples of various allergen advisory statements currently found on packaged food products

1: (Snack bar)	ALLERGENS: Contains almonds. Manufactured in a facility that also processes peanuts, tree nuts, milk, wheat, eggs, and soy.
2: (Candy bar)	ALLERGY INFORMATION: Manufactured in a facility that also processes **PEANUTS**.
3: (Peanut Butter)	**PRODUCED IN A FACILITY THAT PROCESSES TREENUTS.**
4: (Crackers)	**THIS PRODUCT WAS PRODUCED IN A FACILITY THAT PROCESSES MILK.** **MADE IN A PEANUT FREE BAKERY.**

Note. Allergen advisory statement formats (i.e. capitalization, bolding) are presented as they appear on the individual product.

Table 5.3 Product categories identified in ingredient label analysis (n = 20)

Batter Mix	Orange Sauce
RTC Chicken[a]	Oyster Sauce
Oil/Shortening	Plum Sauce
RTC Crab Rangoon[a]	RTC Pork[a]
Duck Sauce	Soy Sauce
RTC Potstickers[a]	Stir-Fry Sauce
RTC Egg Roll[a]	Imitation Crab
Fish Sauce	Sweet & Sour Sauce
General Tso's Sauce	Teriyaki Sauce
Hoisin Sauce	Premade Wrappers

[a] RTC = Ready to Cook

Table 5.4 Sample items containing major allergens[a] (n = 99)

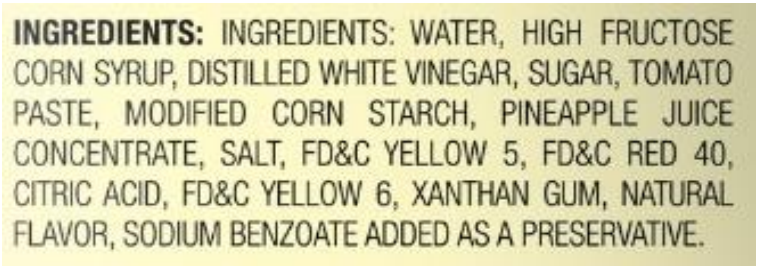
Major Allergen[a]	*n*	%
Wheat	71	71.7
Soy	53	53.5
Egg	31	31.3
Fish	15	15.2
Milk	14	14.1
Shellfish	7	7.1
Peanut	0	0
Tree Nut	0	0

[a]Major allergens as defined by the U.S. Food and Drug Administration (FDA, 2018).

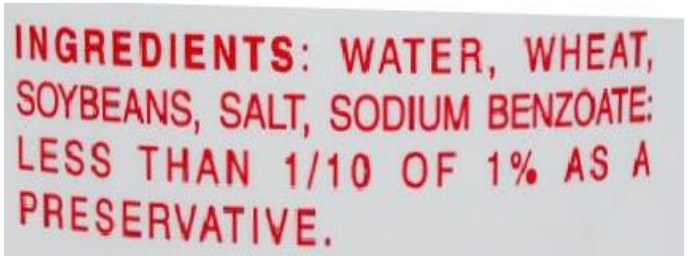
Table 5.5 Product mean and mode major allergens (*n* = 99)

Product	*M*	Most Common Major Allergen in Product
RTC Crab Rangoon [a]	5	Soy, Wheat, Milk
Imitation Crab	4	Egg, Fish
RTC Egg Roll [a]	3	Wheat, Egg
RTC Pork [a]	3	Wheat, Egg
RTC Potstickers [a]	3	Soy, Wheat
Batter Mix	2	Wheat
RTC Chicken [a]	2	Wheat
General Tso's Sauce	2	Soy, Wheat
Hoisin Sauce	2	Soy
Orange Sauce	2	Soy, Wheat
Stir-Fry Sauce	2	Soy, Wheat
Teriyaki Sauce	2	Soy
Premade Wrappers	2	Wheat
Soy Sauce	2	Soy
Sweet & Sour Sauce	1	Soy
Fish Sauce	1	Fish
Oyster Sauce	1	Wheat
Duck Sauce	0	Soy, Wheat
Plum Sauce	0	Wheat
Oil/Shortening	0	None

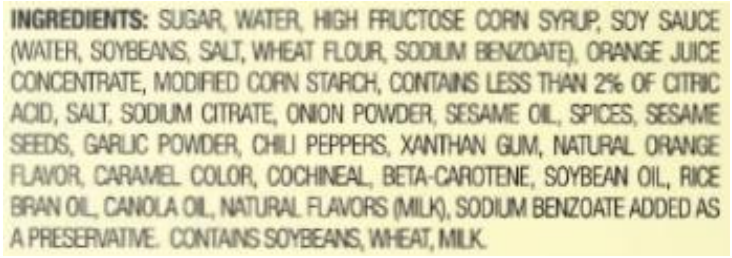
Note. [a] RTC = Ready to Cook



Free of Major Allergens, No Allergen Declaration Required



Common Term Allergen Declaration



Common Term and Contains Statement

Common Term, Contains Statement, and Voluntary Allergen Advisory

Figure 5.1 Sample ingredient labels with allergen declaration and voluntary allergy advisory formats.
Note: Labels were sourced from products in the current study's sample

CHAPTER 6. GENERAL CONCLUSIONS

The purpose of this study was to assess food allergy knowledge, attitudes, practices and training of, and to develop a food allergy reference resource surrounding packaged foods commonly used in Chinese restaurants. Employees of Chinese restaurants' food allergy knowledge, accommodation attitudes and practices, and food allergy training experience were examined; opinions and preferences about future food allergy training programs collected; and, ingredient labels on commonly used Chinese food ingredients were identified and analyzed for major allergens in support of the creation of an allergen reference resource. This final chapter summarizes the study's key findings, identifies limitations, and proposes opportunities for future research.

Summary of Results

Needs Assessment Results

For the needs assessment portion of this study, 386 Chinese restaurants in metro Chicago were visited to invite employees to participate in the study. In total, 98 participants in 98 restaurants completed the survey, resulting in a 25.4% response rate. Respondents for the study were most often between the ages of 34-41 years old (25.8%) and were evenly divided between the genders (53.1% female, 42.9% male, 4.1% no response). Most respondents were born outside the United States (83.7%). Over 40% of respondents had completed high school and a quarter (26.5%) had completed a bachelor's degree.

Half of participants reported more than eight years of foodservice experience and nearly half (46.4%) of all participants reported eight or more years working in Chinese restaurants. Respondents mostly worked full-time (65.3% reported working over 40 hours

per week) while one-third (30.6%) worked part-time (20-40 hours per week). Respondents reported titles were largely irrelevant in their operations as their job duties spanned the entire operation ranging from food preparation and service to cashier and other administrative duties. The types of foodservice operations in the sample, as reported by the participants, were evenly distributed between takeout and delivery (30.9%), casual full-service (36.1%), and fine dining full-service (26.8%). Only six restaurants were described as fast food and no buffet restaurants participated in the study.

The majority (56.8%) of respondents recalled having a customer with food allergy visit their restaurant in the past year. Nearly half of respondents (48.7%) indicated that customers with food allergies visited infrequently, visiting fewer than eight times in the last year (28.4% reported fewer than four customers with food allergy a year, while 20.3% reported 5-8 customers per year), however, over one-third (36.5%) of respondents reported frequent (12+ visits per year) visits from food allergic customers over the past year. The most commonly allergen customers reported were peanuts (28%), followed by seafood (16.5%) and wheat (11.4%). Fish (3.4%) was the least common allergen reported.

The needs assessment sought to satisfy three research objectives and to test five hypotheses. The first research objective was to assess the food allergy knowledge and training needs of employees in Chinese restaurants. Ninety-eight participants completed the questionnaire, which included questions to assess food allergy knowledge and training experiences, as well as opinions on development areas for future research.

The first hypotheses tested as part of first research objective was Chinese restaurant employees will have low knowledge scores regarding food allergy (H_1). The

overall mean score for the knowledge section was 62.5% (7.5 out of a possible 12 points). Similar research investigating foodservice employees knowledge using a difference questionnaire reported knowledge scores for national and state (Alabama) samples 70.5% (*M* = 19.74 of a possible 28 points) and 72.2% (*M* = 20.21 of a possible 28 points), respectively (Lee & Barker, 2017). While the results cannot be directly compared, the study completed by Lee and Barker (2017) suggests that scores may be higher for other foodservice professionals in other geographic areas. Additionally, the score needed for passing the ServSafe® Allergens exam for Illinois is 75% and while the exam's knowledge questions may not be the same, the exam's passing score provides a reference point for expected food allergy knowledge score of foodservice professionals (National Restaurant Association [NRA], 2017). Therefore, when contrasted against other studies, the knowledge score is lower, and H_1 is supported by the findings. Upon inspection of knowledge scores for individual questions, the findings suggest hidden allergens, label use and identification of food allergens, and appropriate responses for food allergy reactions are areas where additional knowledge is needed.

Most respondents were able to correctly identify at least three major allergens (82.5%), the timeline and symptoms of allergic reactions (81.4%, and 86%, respectively), cross-contact practices for in foodservice preparation and service (77.9%, and 61.9%, respectively), and the amount of an allergen safe for consumption by an individual with food allergy (68.8%). However, the number of correct responses to questions regarding management and emergency responses to food allergy reactions were lower, as participants were largely unable to identify the correct pharmaceutical treatment for a severe allergic reaction (only 30.4% were correct) or identify the correct first response to

an allergic reaction (20.8% incorrectly answered that identifying the cause of the reaction was the best first response, while 13.5% answered that administering epinephrine was the correct response). Knowledge regarding food allergen identification and use of food ingredient labels received the lowest scores with only 46.3% correctly answering a question about finding allergens on labels correctly. Understanding sources of hidden allergens in foods also received poor knowledge scores (51.1%).

The second hypotheses—H_2: Chinese restaurant employees will not have completed food allergy specific training experience—was not supported as 32.7% of the study's participants reported receiving food allergy training. While the number of those that reported receiving food allergy training was higher than the hypothesized none, only one-third reporting receiving any training suggests that there may be room for improvement with food allergy training. The data collected regarding past food allergy training reported that of the training topics covered, allergic reaction management was an area that respondents did not recall receiving training in. Participants also noted the identification of major food allergens, avoiding cross-contamination, communicating food allergen information with customers, and reading food labels for allergens as necessary areas of training. These gaps in reported training were also mirrored in lower knowledge scores in the same topics.

The second research objective was to assess food allergy attitudes and practices of employees of Chinese restaurants. Two hypotheses were developed and tested to address this research objective: Chinese restaurant employees will have a negative attitude towards food allergy accommodations in restaurants (H_3); and, Chinese restaurant employees will infrequently follow safe food allergen practices (H_4).

The data does not support H_3 as the mean attitude score was 3.62±0.47 on a 5-point Likert scale, higher than a neutral score (3 out of 5) and corresponding to between a 3 (*Neither Agree nor Disagree*) and 4 (*Agree*) on the scale, leaning towards a positive attitude on the scale. Overall, mean attitude scores were highest for statements about foodservice staff's responsibilities in preventing food allergy reactions and communicating allergen information to customers. Attitudes towards individuals with food allergy were also generally positive (all scores were higher than 3.8) also indicating staff were generally welcoming toward food allergic customers. However, attitudes towards participating in more training with regards to food allergy were lowest overall.

The results of this study do not support H_4, as practice scores for foodservice employees were high for all practice statements. The mean score for practice across all restaurant areas was 4.29±0.64; the mean practice score for kitchen staff was 4.27±0.68 on a 5-point Likert scale while service staff and managers had a mean practice score of 4.33±0.66. The lowest score for kitchen staff related to checking ingredient labels for allergens (4.11±1.15) while the lowest score for service staff and managers concerned handwashing before serving food allergen safe meals (4.14±1.11).

The third research objective for this needs assessment portion of the study was to identify food allergy training preferences for employees in Chinese restaurants. The questionnaire included open-ended questions regarding food allergy training preferences, such as topics to be included in future trainings, excluded, and preferred formats.

Respondents replied that understanding what food allergens are and knowing how to identify and recognize food allergens (n = 16) were important in training. Five respondents were most interested in information on hidden allergens in sauces, foods, or

dishes/meals to help employees identify hazardous and potentially hazardous dishes in future trainings. Four respondents requested training on reading and understanding food labels with one suggesting terms in English (assuming training is in Chinese) so that foodservice employees can match terms and spelling. Several respondents (n = 6) also advocated for training on food allergen communication with customers, while three stated food allergy reaction information and general health consequences were important training topics.

Respondents' preferences for future food allergy training emphasized printed resources, such as a booklet, poster, or flyer (41.38%) that could also serve as materials they could review or reference in the future. Nearly 30% expressed a preference for a classroom-style lecture-based training program with printed materials for reading and review.

Chinese restaurant employees will prefer training targeted to their language and workplace needs (H_5) was the hypothesis for the second research objective. The data collected supported this hypothesis as participants reported their preferred language of communication was Mandarin (43.9%) followed by Cantonese (35.7%) both dialects of the Chinese language which share written characters but differ in grammar and syntax. A few participants also noted in the open-ended question responses a preference for training to be offered in multiple languages (n = 2), and, to accommodate individual literacy levels, include visuals (n = 1).

Resource Creation Results

For the resource creation study, the investigator collected and aggregated product lists from seven food distributors for the study and identified the 20 most common

packaged foods, excluding single-ingredient products (such as cornstarch and sesame oil), as well as the five most frequently appearing items. Ninety-nine ingredient labels, Food Allergen Labeling and Consumer Protection Act (FALCPA) declarations and allergen advisories (if any) were collected for analysis. An allergen ingredient list was compiled from allergen identification resources from food allergy research and advocacy groups and used for product ingredient label analysis and allergen identification. Finally, a food allergen reference resource for Chinese restaurants listing products, brands, item names, ingredient lists, allergen declarations, allergen advisories, and major allergens was created from the collected and analyzed data (Appendix M).

The resource creation sought to satisfy three research objectives and test one hypothesis. The first research objective for the resource creation part (fourth overall) was to identify 20 common packaged foods used in Chinese restaurants. The common packaged food categories were identified as batter mix, ready to cook (RTC) chicken, oil/shortening, RTC crab rangoon, duck sauce, RTC potstickers, RTC egg roll, fish sauce, General Tso's Sauce, hoisin sauce, Orange Sauce, oyster sauce, plum sauce, RTC pork, soy sauce, Stir-Fry Sauce, imitation crab, Sweet and Sour Sauce, Teriyaki Sauce, and, premade wrappers.

The second research objective (fifth overall) was to analyze 20 common ingredients' labels used in Chinese restaurants for ingredients containing major food allergens, adherence to FALCPA, and, use of allergen advisories. Fifteen of the 99 product labels analyzed were free of a major allergen. Among the remaining 84 labels, wheat was the most frequently occurring food allergen (n = 71), followed by soy (n = 53), egg (n = 31), fish (n = 15), milk (n = 14), and shellfish (n = 7) (Table 5.4). No

product ingredient labels in the sample were found to include peanut or tree nut allergens or its derivative products.

The majority (56.6%) of the product labels in the sample used both FALCPA accepted formats; the common terms and "contains" statement. Forty-one items in the sample used the common terms format only. As for listing the common term of the allergen, as prescribed by FALCPA, the majority 60% (n = 59) of the sample used the parentheses format while 26.3% (n = 26) chose to include the common name within the ingredient list.

The hypothesis tested as part of this research was: commonly used Chinese ingredients are unlikely to follow FALCPA's food allergen labeling requirements (H_6). The data collected does not support this hypothesis. None of the items from the sample were in violation of FALCPA's labeling regulations, although two items did have labeling inconsistencies as they omitted a common term following the listing of an allergen's derivative product in the ingredient list, despite listing them after other allergen derivative ingredients in the list but because both products included allergen declarations listing the major allergens no FALCPA violations were found.

Several products' ingredients contained ingredients that could be potential hazards of a major food allergen, such as caramel and caramel coloring, which can be sources of milk and wheat, respectively. Additionally, the term "natural flavors" appeared on multiple (n = 23) product ingredient labels which can pose potential hazards for egg, milk, peanut, soy, tree nuts, and wheat (AAFA). Although labeling inconsistencies and ambiguities can present problems when preparing foods for individuals with food

allergens, they are not violations of FALCPA's labeling regulations, therefore, the H_6 is rejected.

The third objective of this research (sixth research objective overall) was to create a food allergen reference resource of commonly found packaged foods used in Chinese restaurants. In response to this objective, a reference document was created listing the ingredient lists, FALCPA statements, advisory statements, and major allergens of the most commonly found five items within the most commonly found packaged food categories (Appendix M).

Conclusions

This study examined foodservice employees' food allergy knowledge, attitudes, practices, training experiences and preferences, as well analyzed ingredient labels of commonly found Chinese products and created a food allergen reference of packaged food products in Chinese restaurants. The study revealed several key findings that are relevant to foodservice professionals in Chinese restaurants, customers with food allergy, food allergy advocacy groups, and food safety/food allergy training program developers.

The need for targeted food allergy training is important for not only improving food allergy knowledge but ultimately for improving safe food allergy handling practices. Although food safety training programs such as ServSafe® include general information about food allergy (National Restaurant Association, 2018), safe food allergen handling requires targeted training due to specific handling practices relating to food allergens, such as reading ingredient labels, reacting to allergic reaction, and communicating information within staff and with customers. Adequate training surrounding topics such as these are critical for reducing food allergy incidence and an emphasis on these topics

in training is important. Foodservice managers need to acknowledge the importance of food allergy training in preventing incidence in their operations and provide additional food allergen training on-the-job or encourage employees to pursue additional training to safely accommodate individuals with food allergy.

Food safety training providers may wish to consider reexamining existing food safety programs to potentially including more food allergy specific information as part of the broader food safety training program. In doing so, food allergy knowledge and training may see some improvement, as food safety certification programs seem to be more frequently completed by food handlers.

Safe food allergy handling practices were also found to be positively influenced by positive attitudes towards food allergy in addition to having food safety certification. As food safety certification is more commonly found across the foodservice industry the improvement of attitudes may be able to work in tandem to improve practices until more targeted training becomes commonplace among foodservice professionals. Foodservice managers may wish to consider sharing with staff the benefits to the business accommodating food allergic individuals could have, such as customer loyalty and increased sales (Melnick, 2010), to provide context and potential motivations for staff to revisit their attitudes towards food allergy accommodations.

Improving upon or creating additional resources and programs for food allergy training to ensure that training is being adequately received, understood, and implemented may also be an area deserving of additional attention in the prevention of food allergy incidence in foodservice operations. Food safety training program developers, foodservice industry leaders, and/or food allergy advocacy groups may wish

to consider revisiting training programs and materials to determine if gaps exist in the training or if improvements in training delivery can be made to ensure critical information about food allergy reaction management and ingredient label reading is retained by those completing the training. Respondents in this study that had received food allergy training reported gaps in knowledge and were unable to recall training in some areas of food allergy training, suggesting that training received was not sufficiently impactful or otherwise memorable in those topics.

As part of an assessment of current food allergy training, industry and program developers may also wish to explore alternative ways to provide training and information to mitigate some the barriers to food allergy training. Stakeholders could consider reviewing the results of this study as they consider opportunities to improve training program content and delivery methods to understand and tailor programs to foodservice professionals' training preferences.

Possible explorations areas of delivery improvement identified in this study include changing delivery format (e.g. moving from predominately text-based materials to visually-based materials to address different literacy and educational levels) and content (i.e. including a diversity of ingredients from multiple cuisines, or creating cuisine-specific or culturally specific programs), providing a greater diversity of languages to reflect the foodservice industry's ethnic diversity (ensuring that information is being properly communicated to individuals with varying levels of English fluency), or creating programs able to be delivered through different mediums, such as mobile apps, podcasts, video-based training, posters, or online classes (to address different learning styles and preferences of foodservice professionals).

Ambiguity and uncertain FALCPA compliance on food allergy labels were found as were inconsistencies in formatting and wording for allergen advisory labels. Further development of information and the potential future creation of a food allergy resource targeted to foodservice professionals may be useful. However, inaccurate labels or confusing labels create unnecessary barriers in the identification of allergens for foodservice professionals and consumers alike and should also be addressed to improve the efficacy of any future reference materials. The Food and Drug Administration (FDA) may wish to consider revisiting FALCPA guidelines to provide greater clarity and eliminate issues of ambiguity, and industry associations should consider creating instructional guides for foodservice professionals on how to read ingredient labels for food allergens and, potentially, how to report manufacturers that are not compliant.

This study contributes to the growing body of literature on food allergen training of foodservice staff. This study was the first to assess food allergy knowledge, attitudes, practices, training experience and preferences of Chinese restaurant employees and to create a reference resource for the identification of hidden allergens in packaged foods commonly found in Chinese restaurants. The study's findings further validate previous research that foodservice employees' knowledge of food allergy is limited and that previously identified barriers, such as communication issues, hidden allergens, and unsafe handling practices causing cross-contact may be to blame for food allergy incidences in restaurants.

Additionally, this study contributes to the literature in providing information about preferred training methods and areas of further training development and improvement for foodservice professionals, particularly those in ethnic foodservice

operations, such as Chinese restaurants. In this way, these findings can help to improve future training programs and resources, such as providing culturally-specific content or offering training in a wider variety of formats and languages, that educate foodservice professionals on how to provide safe food allergy meals, reducing food allergy incidence for the benefit of food allergic individuals and the foodservice industry.

Limitations of the Study

The needs assessment sample only included employees of Chinese restaurants in metro Chicago. Although all the Chinese restaurants in Chicago were included in the sample, the study's response rate (25.4%) was low and may not be representative of all Chinese restaurant employees in Chicago making it inappropriate to generalize to all Chinese restaurants or all Chicago restaurants.

The needs assessment used self-reported data to assess food allergy attitudes and practices. Given the research topic and given that participants completed the surveys in front of the primary investigator, it is possible that the accuracy of the data collected may have been subject to social desirability bias, as participants may be overreporting their positive attitudes and correct allergen handling practices.

The ingredient analysis and reference creation also has some limitations. The sample size of products for the study reflected a small proportion of the vast packaged foods available and in use in Chinese restaurants. Therefore, while this reference guide can start to begin to address the training and reference material needs for employees of Chinese food restaurants, it is limited.

Additionally, few foodservice distributors were willing to participate in the study as product lists and sales are perceived as proprietary information for the businesses. As

such, the study sample was collected from a small group of distributors, thus the data collected for this research is limited and may not be reflective of the entire industry.

Recommendations for Future Research

Future research may wish to conduct a larger food allergy needs assessment to better understand the knowledge and training needs for employees of Chinese restaurants. In obtaining a better understanding of the needs of foodservice employees working in Chinese restaurants, future trainings programs can be adapted to suit the specific training needs of Chinese restaurant employees. Additionally, future research may wish to assess the knowledge and training needs of Chinese restaurant employees using alternate research methods to circumvent issues of social desirability bias. Investigators may wish to conduct observational studies to assess the food allergen handling and accommodation practices of employees or design experimental studies to assess employee knowledge and communication of knowledge to customers.

For ingredient analysis and reference creation, investigators may look to collect data regarding common or frequently used products from employees of Chinese restaurants by interviewing employees, conducting audits of Chinese restaurant pantries, or by examining food order invoices. This approach may gather more relevant data regarding the foods and brands most frequently used in Chinese restaurants and provide a more useful reference guide for other Chinese restaurant professionals.

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APPENDIX A: HUMAN SUBJECTS APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 3/14/2018

To: Lilly Jan
[redacted]
Boxborough, MA 01719

CC: Dr. Lakshman Rajagopal
10 MacKay Hall

From: Office for Responsible Research

Title: FOOD ALLERGY TRAINING FOR EMPLOYEES OF CHINESE RESTAURANTS: NEEDS ASSESSMENT AND ALLERGEN IDENTIFICATION

IRB ID: 18-159

Study Review Date: 3/13/2018

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
  - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
  - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

  Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

  Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption,** even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

APPENDIX B: QUESTIONNAIRE INFORMED CONSENT DOCUMENT (ENGLISH)

Hello!

My name is Lilly Jan I am a doctoral candidate at Iowa State University researching Chinese restaurant employees' food allergy knowledge, attitudes, practices and training. You are being asked to participate in this study because you are a restaurant employee of a Chinese restaurant.

If you agree to participate, you will be asked to complete a questionnaire to understand your knowledge, attitudes, practices, and training experience (if any) with food allergies. You will also be asked for any ideas you might have about how to best create a food allergy training program for Chinese restaurant employees. The survey takes approximately 10 minutes.

Your participation is voluntary. By completing the following questionnaire, you are agreeing to participate in this study. Refusal to participate will involve no penalty and you may discontinue participation at any time without penalty.

Please read each question carefully before responding and you may skip any question you do not feel comfortable answering. Your responses are anonymous, will be kept confidential and no information will be shared with your managers or colleagues.

If you have any questions *about the rights of research subjects or research-related injury*, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115.

You are encouraged to ask questions at any time during this study. If you have any questions about this study, please contact Lilly Jan via email ljan@iastate.edu or the supervising faculty member, Dr. Lakshman Rajagopal lraj@iastate.edu.

Thank you for your time!

Sincerely,

Lilly Jan
Doctoral Candidate
Iowa State University
Phone: 617-903-8023
E-mail: ljan@iastate.edu

Lakshman Rajagopal, PhD
Associate Professor
Iowa State University
Phone: 515-294-9740
E-mail: lraj@iastate.edu

APPENDIX C: QUESTIONNAIRE INFORMED CONSENT DOCUMENT (TRADITIONAL CHINESE)

你好！

我是 Lilly Jan。我是愛荷華州立大學博士研究生，研究中國餐館員工的食物過敏知識，態度，實踐和培訓。你被要求參加這項研究，因為你是一家中國餐館的餐廳員工。

如果您同意參加，您將被要求填寫調查問卷，以瞭解您對食物過敏的知識，態度，實踐和培訓經歷（如有）。你也會被要求提供關於如何最好地為中國餐館員工製定食物過敏培訓計劃的想法。這項調查大約需要 10 分鐘。

您的參與是自願的。通過填寫以下問卷，您同意參加本研究。拒絕參與將不涉及任何處罰，您可以隨時停止參與而不受處罰。請在回答之前仔細閱讀每個問題，並且您可以跳過任何您不想回答的問題。您的回覆將會匿名和保密，並且不會向您的經理或同事分享任何資訊。

如果您對研究項目權利與研究相關後果有任何疑問，請聯繫 IRB 管理員（515）294-4566，IRB@iastate.edu 或主任（515）294-3115。

鼓勵您在此研究過程中隨時提問。如果您對本研究有任何疑問，請通過電子郵件 Lilly Jan (ljan@iastate.edu) 或監督教員 Lakshman Rajagopal (lraj@iastate.edu) 。

感謝您花費時間參與此研究！

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APPENDIX D: QUESTIONNAIRE INFORMED CONSENT DOCUMENT (SIMPLIFIED CHINESE)

你好！

我是 Lilly Jan。我是爱荷华州立大学博士研究生，研究中国餐馆员工的食物过敏知识，态度，实践和培训。你被要求参加这项研究，因为你是一家中国餐馆的餐厅员工。

如果您同意参加，您将被要求填写调查问卷，以了解您对食物过敏的知识，态度，实践和培训经历（如有）。你也会被要求提供关于如何最好地为中国餐馆员工制定食物过敏培训计划的想法。这项调查大约需要 10 分钟。

您的参与是自愿的。通过填写以下问卷，您同意参加本研究。拒绝参与将不涉及任何处罚，您可以随时停止参与而不受处罚。请在回答之前仔细阅读每个问题，并且您可以跳过任何您不想回答的问题。您的回复将会匿名和保密，并且不会向您的经理或同事分享任何信息。

如果您对研究项目权利与研究相关后果有任何疑问，请联系 IRB 管理员（515）294-4566，IRB@iastate.edu 或主任（515）294-3115。

鼓励您在此研究过程中随时提问。如果您对本研究有任何疑问，请通过电子邮件 Lilly Jan (ljan@iastate.edu) 或监督教员 Lakshman Rajagopal (lraj@iastate.edu) 。

感谢您花费时间参与此研究！

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APPENDIX E: NEEDS ASSESSMENT QUESTIONNAIRE (ENGLISH)

Section One: Tell Us What You Think

Instructions: Please indicate your level of agreement or disagreement with each statement.

Item	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I think preventing food allergy reaction is an important part of my job responsibilities.					
Food allergy training is not useful to me.					
I am willing to change my food handling behaviors related to handling food allergens.					
It is important to me that accurate information about food ingredients is provided to customers.					
My workplace should refuse to serve people with food allergy.					
I believe it is entirely the customers' responsibility to avoid food allergens.					
I think my workplace is responsible for educating me about food allergy and allergen handling.					
A person with food allergy should not be eating in restaurants.					
Food allergy is a serious health issue.					
I cannot guarantee a food allergen safe meal.					
I believe that providing customers with food allergy information will decrease the likelihood of a food allergic reaction.					
Food allergy training is not a good use of my time.					
Learning about food allergy is important to me.					
I am willing to attend training courses to learn more about food allergy.					
Food allergy customers are just picky eaters.					
Serving a customer with food allergy is not worth the potential liability.					

Section Two: Tell Us What You Know

Instructions: Please read each statement carefully and select the answer you believe to be correct.

1. Which of the following is **NOT** considered a major food allergen?
   a) Fruit
   b) Wheat
   c) Shellfish
   d) Soy

2. Which body system can be affected by a food allergy reaction?
   a) Gastrointestinal tract
   b) Respiratory system
   c) Skin
   d) All of the above

3. How soon does a food allergy reaction occur after the food is consumed?
   a) Immediately or within a few hours after the food is consumed.
   b) Twenty-four hours after the food is consumed.
   c) Thirty-six hours after the food is consumed.
   d) Forty-eight hours after the food is consumed.

4. Which of the following is the best treatment for controlling a severe food allergic reaction?
   a) Benadryl™
   b) Pseudoephedrine
   c) Epinephrine
   d) Aspirin

5. When preparing or serving a meal for a person with a food allergy, it is important to:
   a) Discuss the meal with the customer with food allergy.
   b) Check ingredient labels of foods used to make the meal.
   c) Deliver the food allergen safe meal to the customer separately.
   d) All of the above.

6. Which of the following practices could cause cross-contact?
   a) Using the same cooking surfaces to prepare allergen-free foods as allergen-containing foods.
   b) Cooking allergen-free food in the same cooking equipment as allergen-containing foods.
   c) Not washing hands before handling the allergen-free food.
   d) All of the above.

7. How much of a food allergen is safe for a food allergic person to eat?
   a) Small amounts are safe.
   b) None.
   c) Varies with the food.
   d) Depends on how the food was prepared.

8. If a customer is experiencing an allergic reaction, what is the best first response?
   a) Determine what caused the reaction.
   b) Call for medical help.
   c) Find the customer's epinephrine and administer the medication.
   d) Fire the person responsible for making the food that caused the reaction.

9. Why can fried foods be dangerous for individuals with food allergy?
   a) The high fat content in fried foods makes allergic reactions worse.
   b) Frying changes the chemical structure of foods.
   c) Cross-contact with food allergens can occur if the oil was used to cook other allergen containing foods.
   d) The high starch content makes allergic reactions worse.

10. Which of the following items are risky for food-allergic customers?
    a) Menu items with many ingredients.
    b) Desserts.
    c) Sauce-covered foods.
    d) All of the above.

11. What are some of the symptoms of an allergic reaction?
    a) Sneezing, dizziness, muscle pain, headache.
    b) Wheezing, facial swelling, abdominal cramps, vomiting.
    c) Constipation, bloating, gas, heartburn.
    d) Lack of energy, backache, depression, anxiety.

12. Where can you find whether an ingredient being used contains an allergen?
    a) Looking on the manufacturer's website.
    b) By asking a manager.
    c) Reading the ingredient label.
    d) The customer should know what foods they cannot eat.

Please continue to next section

Section Three: Tell Us What You Do

Instructions: Please find the section that best fits your job role and indicate how often you engage in these practices.

Kitchen Staff

Item	Never	Rarely	Sometimes	Often	Always	Not applicable
I prepare allergen-containing and allergen-free dishes separately.						
I told staff members a dish did not contain any allergens when I was unsure.						
I use clean and sanitized cooking equipment to prepare allergen-free dishes.						
I read labels of ingredients when preparing food for a customer with a food allergy.						
When a customer with a food allergy comes in, I know exactly what to do.						
My workplace has told me what I should do when someone tells me they have a food allergy.						
I communicate with other staff members to ensure an allergy safe meal is prepared.						

Service Staff and Managers

Item	Never	Rarely	Sometimes	Often	Always	Not applicable
I serve allergen-containing and allergen-free plates separately.						
I told customers a dish did not contain any allergens when I was unsure.						
I wash my hands before serving customers with food allergy their food.						
I provide accurate information to customers regarding a dish's ingredients.						
When a customer with a food allergy comes in, I know exactly what to do.						
My workplace has told me what I should do when someone tells me they have a food allergy.						
I communicate with other staff members to ensure an allergy safe meal is prepared.						

Section Four: Tell Us About Your Training

Instructions: Please circle the answer(s) that apply.

1. Have you ever received training specific to food allergies and allergen handling?

Yes (Continue to Question 2) No (Go to Question 5)

2. What was the food allergy training program you received?

ServSafe® Allergen AllerTrain™ Allergen Friendly™

Part of food safety training On the job Previous workplace

Other, please specify _____

3. *Instructions: Please read the following statements and indicate Yes or No.*

Item	Yes	No
I have received training about food allergy.		
I have received training to identify the major food allergens.		
I have received training on how to read food ingredient labels for food allergen identification.		
I have received training on how to avoid cross-contact between foods during food preparation or service.		
I have received training on how to communicate allergen information to customers.		
I have received training on how to handle an allergic reaction.		

4. Instructions: Please rate your perception on the need for training in the following topics.

Item	Very unnecessary	Somewhat unnecessary	Neither necessary or unnecessary	Somewhat Necessary	Very Necessary
Training about food allergy.					
Training to identify the major food allergens.					
Training on how to read ingredient labels for food allergen.					
Training on how to avoid cross-contact between foods during food preparation/service.					
Training on how to communicate with customers about allergens.					
Training on how to handle an allergic reaction.					

Instructions: Please write your answer to the following questions as clearly as possible.

5. If you were to design a food allergy training program for your workplace, what would you **include**?

6. If you were to design a food allergy training program for your workplace, what would you **exclude**?

7. What would be your **ideal** training style for conducting food allergy training? (Lecture, online class, mobile app, booklet, posters, etc.)

Section Five: Tell Us About You and Your Workplace

Instructions: Please circle best answer to describe yourself.

1. What is your age? 18 – 25 years old | 26 – 33 years old | 34 – 41 years old | 42 – 49 years old | Older than 50 years old

2. What is your gender? Male | Female | Prefer not to answer

3. Where were you born? United States | International/Outside the U.S.

4. In what language are you most comfortable communicating?

Mandarin | Cantonese | Spanish | English | Other_____

5. How would you describe your English fluency?

Excellent | Good | Average | Poor | None/I don't know any English

6. What is the highest level of education you have completed?

Did not attend school | Some high school | High school/ GED | Associate degree | Bachelor's degree | Master's degree | Doctoral degree

7. How long have you worked in foodservice?

Less than 1 year | 1-3 years | 4-6 years | 6-8 years | 8+ years

8. How long have you worked in Chinese food restaurants?

Less than 1 year | 1-3 years | 4-6 years | 6-8 years | 8+ years

9. How would you best describe your restaurant?

Quick Service | Takeout & Delivery | Casual full-service | Fine dining full-service | Buffet

10. Which work area(s) are you involved with? (Circle all that apply.)

Food Preparation | Service | Dish Room | Facility Clean-Up | Non-Food Contact (office/cashier/etc.) | Other, please specify: _____

11. How many hours per week do you work? Under 20 hours per week | 20 – 40 hours per week | Over 40 hours per week

12. Do you have food safety certification? Yes | No

If yes, please continue to 12a. If no, please continue to 13.

12a. If so, which certification do you have?

ServSafe® | National Environmental Health Association (NEHA) | Other, please specify: _____

13. Do you or any family members have a food allergy? Yes | No

14. Have you had a customer with a food allergy in your restaurant in the last year? Yes No I don't know

If yes, please continue to 14a. If no, please continue to end.

14a. How frequently does a customer with a food allergy visit your restaurant?

Rarely (4 or less customers per year)	Occasionally (5-8 customers per year)	Often (9-12 customers per year)	Frequently (12+ customers per year)

14b. Among the customers with food allergies that visit your restaurant, what has been the most common food allergen?

Soy	Milk	Tree nuts	Peanuts
Seafood	Fish	Wheat	Eggs

Other(s): _____

Thank you for your time!

APPENDIX F: NEEDS ASSESSMENT QUESTIONNAIRE (TRADITIONAL CHINESE)

第一部分：告訴我們您的想法

說明：請說明您的聲明達成一致或不同意的程度。

項目	強烈不同意	不同意	既不同意也不反對	同意	非常同意
我認為防止食物過敏反應是我工作職責的重要組成部分。					
食物過敏訓練對我無用。					
我願意改變與處理食物過敏原有關的食物處理行為。					
對我而言，向客戶提供關於食品成份的準確信息是非常重要的.					
我的工作場所應該拒絕為對食物過敏的人服務。					
我相信避免食物過敏原是客戶的責任。					
我認為我的工作場所應該負責教育我關於食物過敏和過敏原處理。					
有食物過敏的人不應在餐館用餐。					
食物過敏是一個嚴重的健康問題。					
我無法保證食物過敏原安全的膳食。					
我相信，向食物過敏的顧客披露準確的過敏原資訊，會降低食物過敏反應的可能性。					
食物過敏訓練對我來說不值得我的時間。					
瞭解食物過敏對我很重要。					
我願意參加培訓課程，以便更多地瞭解食物過敏。					
食物過敏的顧客只是挑食。					
為食物過敏的顧客服因為會有潛在的風險，所以是不值得的。					

第二部分：告訴我們您所知道的

說明：請仔細閱讀每條陳述，並選擇您認為正確的答案。

1. 以下哪項不被視為主要的食物過敏原?
   a) 水果
   b) 麥
   c) 貝類
   d) 黃豆

2. 哪種人體系統可能會受到食物過敏反應的影響?
   a) 胃腸道
   b) 呼吸系統
   c) 皮膚
   d) 上述所有的

3. 食物消耗後多久會發生食物過敏反應?
   a) 立即或在食物消耗後的幾小時內。
   b) 食物消耗 24 小時後。
   c) 食物消耗 36 小時後。
   d) 食物消耗 48 小時後。

4. 以下哪一項是控制嚴重食物過敏反應的最佳治療方法?
   a) Benadryl™ （中譯：抗組胺藥）
   b) Pseudoephedrine （中譯：偽麻黃鹼）
   c) Epinephrine (中譯：腎上腺素)
   d) Aspirin (中譯：阿司匹林)

5. 為有食物過敏症的人烹飪或準備膳食時，重要的是:
   a) 與食物過敏的顧客討論其膳食。
   b) 檢查用於製作膳食的食物的成分標籤。
   c) 將食物過敏原安全單獨分別送給顧客。
   d) 上述所有的。

6. 以下哪種做法可能會導致交叉接觸?
   a) 使用相同的烹飪料理枱面來製造含過敏原食品與無過敏原食品。
   b) 在與含過敏原食物相同的烹飪設備中烹飪無過敏原食物。
   c) 在處理無過敏原食物前不洗手。
   d) 上述所有的。

7. 對食物過敏的人來說，吃多少過敏的食物是安全的?
   a) 少量是安全的。
   b) 完全不吃。
   c) 根據食物成份來做決定。
   d) 取決於食物做法來做決定。

8. 如果客戶正在經歷過敏反應，那麼最好的第一反應是什麼?
   a) 確定是什麼引起的反應。
   b) 尋求醫療幫助。
   c) 找到客人的腎上腺素，並給客人服用藥物。
   d) 解僱引起過敏反應食物的負責人。

9. 為什麼油炸食品對食物過敏的人會有危險?
   a) 油炸食品中的高脂肪含量會使過敏反應變得更糟。
   b) 油炸會改變食物的化學結構。
   c) 如果油已被用來烹飪含有過敏原的食物，可能會發生與食物過敏原的交叉接觸。
   d) 高澱粉含量使過敏反應變糟。

10. 以下哪項食品過敏的顧客有風險?
    a) 食物中有許多種成份。
    b) 甜品。
    c) 醬汁覆蓋的食物。
    d) 上述所有的。

11. 過敏反應都有哪些症狀?
    a) 打噴嚏，頭暈，肌肉疼痛，頭痛。
    b) 喘鳴，面部腫脹，腹部絞痛，嘔吐。
    c) 便秘，腹脹，脹氣，胃灼熱。
    d) 缺乏活力，背痛，抑鬱，焦慮。

12. 你在哪裡可以找到你正在使用的成份是否含有過敏原?
    a) 查看製造商的網站。
    b) 通過詢問經理。
    c) 閱讀成份標籤。
    d) 顧客應該知道他們不能吃什麼食物。

請繼續閱讀下一節

第三部分：告訴我們你目前對食物敏感原的做法

說明：請找到最適合您工作崗位的部分，並說明您在工作場所從事這些活動的頻率。

廚房員工

項目	決不	很少	有時	經常	總是	不適用
在為食物過敏患者準備食物時，我會分別準備含過敏原和無過敏原的食物。						
當我不確定時，我會告訴工作人員這道菜不含敏感原。						
我使用乾淨和消毒的烹飪設備來防止交叉接觸。						
當為食物過敏的顧客準備食物時，我會閱讀標貼上的配料。						
當顧客確認有食物過敏時，我確切知道該怎麼做。						
當顧客告訴我他們有食物過敏時，我的工作場所有教導我該怎麼做。						
我與其他員工溝通，以確保過敏安全的飯菜。						

服務人員和管理人員

項目	決不	很少	有時	經常	總是	不適用
在向有食物過敏的顧客侍候食物時，我會分別將含過敏原和無過敏原的碗盤分開，以防止交叉接觸。						
當我不確定時，我會告訴顧客這道菜不含敏感原。						
在侍候無過敏原餐前，我用肥皂和水徹底洗手。						
當顧客告知是食物過敏人時，我會向他們提供有關菜餚成份的準確資訊。						
當顧客確認有食物過敏時，我確切知道該怎麼做。						
當顧客告訴我他們有食物過敏時，我的工作場所有教導我該怎麼做。						
我與其他員工溝通，以確保過敏安全的飯菜。						

第四部分：告訴我們你已接受的訓練

說明：請圈出適用的答案。

1. **您有沒有接受過針對食物過敏和過敏原處理的培訓?**

是（繼續問題 2） **否 （轉到問題 5）**

2.**你接受了下面那一種食物過敏培訓計劃?**

ServSafe® Allergen **部份的食品安全培訓**

AllerTrain™ **來自內部經理的培訓**

Allergen Friendly™ **之前的工作培訓**

如有其他，請說明：

_____

3. *說明：請閱讀以下說明並指出“是”或“否”。*

項目	是	否
我接受過了關於食物過敏的培訓。		
我接受過了辨認主要食物過敏原的培訓。		
我接受過了閱讀食品成分標籤上辨認食品過敏原的培訓。		
我接受過了有關如何避免在食物準備或侍候期間，食物間發生交叉接觸的培訓。		
我接受過了如何與顧客溝通有關過敏原知識的培訓。		
我接受過了如何應付食物過敏反應的培訓。		

4. *說明：請評估您對以下主題的培訓需求的看法。*

項目	非常不必要	有些不必要	無關緊要	有點必要	非常必要
食物過敏的培訓。					
辨認主要食物過敏原的培訓。					
如何閱讀食物過敏原成份標籤的培訓。					
如何避免準備食物或侍候期間食物之間的交叉接觸的培訓。					
如何與顧客溝通過敏原的培訓。					
如何應付過敏反應的培訓。					

說明：請盡可能清楚地寫下以下問題的答案。

5. 如果你想為你的工作場所設計一個食物過敏培訓計劃，你會**包括**什麼?

6. 如果您要為您的工作場所設計食物過敏培訓計劃，您會**排除**什麼?

7. 你的**理想**的進行食物過敏訓練方式是什麼? (講座，在線課堂，手機應用程式，小冊子，海報，等等）

第五部分：介紹給我們關於你和你的工作場所

說明：請圈出最佳答案來形容你自己。

1. 你今年幾歲? 18 – 25 歲 26 – 33 歲 34 – 41 歲 42 – 49 歲 超過 50 歲
2. 你的性別是什麼? 男 女 不想回答
3. 你在哪裡出生? 美國 國際/在美國以外
4. 用什麼語言你最適合溝通?

普通話 廣東話 西班牙語 英語 其他：_____

5. 你如何描述你的英語流利程度?

很好 好 一般 不好 我不懂英語

6. 什麼是您完成的最高級別的教育?

沒有上學 高中學歷 高中畢業生 副學士學位 學士學位 碩士 博士學位

7. 你在食品服務工作多久了?

不到 1 年 1-3 年 4-6 年 6-8 年 8 年以上

8. 你在中國餐館工作多久了?

不到 1 年 1-3 年 4-6 年 6-8 年 8 年以上

9. 你如何最好地描述你的餐廳?

速食店 外賣和送貨 休閒全方位服務 美食全方位服務 自助餐

10. 您參與哪個工作區域? *(圈出所有適用的項目。)*

準備食材 侍候 洗碗 設備清理 非食品接觸(辦公室, 出納員, 洗衣店) 其他，請明確說明: _____

11. 你每週工作幾個小時? 每週 20 小時以下 每週 20 - 40 小時 每週超過 40 小時
12. 你有食品安全認證嗎? 有 沒有

如果有，請繼續 12a。如果沒有，請繼續 13。

12a. 如果有，是哪一個認證?

ServSafe® National Environmental Health Association (NEHA) 其他，請明確說明: _____

13. 你或任何家庭成員是否有食物過敏? 有 沒有
14. 去年在你的餐廳有過食物過敏的顧客嗎? 有 沒有 我不知道

如果有，請繼續到 14a。如果沒有，請繼續結束。

14a. 有食物過敏的顧客平均一年有多少人會來你的餐廳?

很少 (每年 4 或更少的客戶)　少 (每年 5-8 顧客)　偶爾 (每年 9-12 顧客)　經常 (每年 12 以上顧客)

14b. 在食物過敏顧客訪問你的餐廳的過程中，最常見的食物過敏原是什麼?

黃豆　牛奶　各種堅果　花生

貝類　魚　麥　蛋

其他：

_____

_

感謝您的時間!

APPENDIX G: NEEDS ASSESSMENT QUESTIONNAIRE (SIMPLIFIED CHINESE)

第一部分：告诉我们您的想法

说明：请说明您的声明达成一致或不同意的程度。

项目	强烈不同意	不同意	既不同意也不反对	同意	非常同意
我认为防止食物过敏反应是我工作职责的重要组成部分。					
食物过敏训练对我无用。					
我愿意改变与处理食物过敏原有关的食物处理行为。					
对我而言，向客户提供关于食品成份的准确信息是非常重要的.					
我的工作场所应该拒绝为对食物过敏的人服务。					
我相信避免食物过敏原是客户的责任。					
我认为我的工作场所应该负责教育我关于食物过敏和过敏原处理。					
有食物过敏的人不应在餐馆用餐。					
食物过敏是一个严重的健康问题。					
我无法保证食物过敏原安全的膳食。					
我相信，向食物过敏的顾客披露准确的过敏原信息，会降低食物过敏反应的可能性。					
食物过敏训练对我来说不值得我的时间。					
了解食物过敏对我很重要。					
我愿意参加培训课程，以便更多地了解食物过敏。					
食物过敏的顾客只是挑食。					
为食物过敏的顾客服因为会有潜在的风险，所以是不值得的。					

第二部分：告诉我们您所知道的

说明：请仔细阅读每条陈述，并选择您认为正确的答案。

1. 以下哪项不被视为主要的食物过敏原?
   a) 水果
   b) 麦
   c) 贝类
   d) 黄豆

2. 哪种人体系统可能会受到食物过敏反应的影响?
   a) 胃肠道
   b) 呼吸系统
   c) 皮肤
   d) 上述所有的

3. 食物消耗后多久会发生食物过敏反应?
   a) 立即或在食物消耗后的几小时内。
   b) 食物消耗 24 小时后。
   c) 食物消耗 36 小时后。
   d) 食物消耗 48 小时后。

4. 以下哪一项是控制严重食物过敏反应的最佳治疗方法?
   a) Benadryl™（中译：抗组胺药）
   b) Pseudoephedrine （中译：伪麻黄碱）
   c) Epinephrine (中译：肾上腺素)
   d) Aspirin (中译：阿司匹林)

5. 为有食物过敏症的人烹饪或准备膳食时，重要的是:
   a) 与食物过敏的顾客讨论其膳食。
   b) 检查用于制作膳食的食物的成分标签。
   c) 将食物过敏原安全单独分别送给顾客。
   d) 上述所有的。

6. 以下哪种做法可能会导致交叉接触?
   a) 使用相同的烹饪料理枱面来制造含过敏原食品与无过敏原食品。
   b) 在与含过敏原食物相同的烹饪设备中烹饪无过敏原食物。
   c) 在处理无过敏原食物前不洗手。
   d) 上述所有的。

7. 对食物过敏的人来说，吃多少过敏的食物是安全的?
   a) 少量是安全的。
   b) 完全不吃。
   c) 根据食物成份来做决定。
   d) 取决于食物做法来做决定。

8. 如果客户正在经历过敏反应，那么最好的第一反应是什么?
   a) 确定是什么引起的反应。
   b) 寻求医疗帮助。
   c) 找到客人的肾上腺素，并给客人服用药物。
   d) 解雇引起过敏反应食物的负责人。

9. 为什么油炸食品对食物过敏的人会有危险?
   a) 油炸食品中的高脂肪含量会使过敏反应变得更糟。
   b) 油炸会改变食物的化学结构。
   c) 如果油已被用来烹饪含有过敏原的食物，可能会发生与食物过敏原的交叉接触。
   d) 高淀粉含量使过敏反应变糟。

10. 以下哪项食品过敏的顾客有风险?
    a) 食物中有许多种成份。
    b) 甜品。
    c) 酱汁覆盖的食物。
    d) 上述所有的。

11. 过敏反应都有哪些症状?
    a) 打喷嚏，头晕，肌肉疼痛，头痛。
    b) 喘鸣，面部肿胀，腹部绞痛，呕吐。
    c) 便秘，腹胀，胀气，胃灼热。
    d) 缺乏活力，背痛，抑郁，焦虑。

12. 你在哪里可以找到你正在使用的成份是否含有过敏原?
    a) 查看制造商的网站。
    b) 通过询问经理。
    c) 阅读成份标签。
    d) 顾客应该知道他们不能吃什么食物。

请继续阅读下一节

第三部分：告诉我们你目前对食物敏感原的做法

说明：请找到最适合您工作岗位的部分，并说明您在工作场所从事这些活动的频率。

厨房员工

项目	决不	很少	有时	经常	总是	不适用
在为食物过敏患者准备食物时，我会分别准备含过敏原和无过敏原的食物。						
当我不确定时，我会告诉工作人员这道菜不含敏感原。						
我使用干净和消毒的烹饪设备来防止交叉接触。						
当为食物过敏的顾客准备食物时，我会阅读标贴上的配料。						
当顾客确认有食物过敏时，我确切知道该怎么做。						
当顾客告诉我他们有食物过敏时，我的工作场所有教导我该怎么做。						
我与其他员工沟通，以确保过敏安全的饭菜。						

服务人员和管理人员

项目	决不	很少	有时	经常	总是	不适用
在向有食物过敏的顾客侍候食物时，我会分别将含过敏原和无过敏原的碗盘分开，以防止交叉接触。						
当我不确定时，我会告诉顾客这道菜不含敏感原。						
在侍候无过敏原餐前，我用肥皂和水彻底洗手。						
当顾客告知是食物过敏人时，我会向他们提供有关菜肴成份的准确信息。						
当顾客确认有食物过敏时，我确切知道该怎么做。						
当顾客告诉我他们有食物过敏时，我的工作场所有教导我该怎么做。						
我与其他员工沟通，以确保过敏安全的饭菜。						

第四部分：告诉我们你已接受的训练

说明：请圈出适用的答案。

1. 您有没有接受过针对食物过敏和过敏原处理的培训?

是（继续问题 2）　　否 （转到问题 5）

2.你接受了下面那一种食物过敏培训计划?

ServSafe® Allergen	AllerTrain™	Allergen Friendly™
部份的食品安全培训	来自内部经理的培训	之前的工作培训
	如有其他，请说明：	

_____

3. *说明：请阅读以下说明并指出“是”或“否”。*

项目	是	否
我接受过了关于食物过敏的培训。		
我接受过了辨认主要食物过敏原的培训。		
我接受过了阅读食品成分标签上辨认食品过敏原的培训。		
我接受过了有关如何避免在食物准备或侍候期间，食物间发生交叉接触的培训。		
我接受过了如何与顾客沟通有关过敏原知识的培训。		
我接受过了如何应付食物过敏反应的培训。		

4. *说明：请评估您对以下主题的培训需求的看法。*

项目	非常不必要	有些不必要	无关紧要	有点必要	非常必要
食物过敏的培训。					
辨认主要食物过敏原的培训。					
如何阅读食物过敏原成份标签的培训。					
如何避免准备食物或侍候期间食物之间的交叉接触的培训。					
如何与顾客沟通过敏原的培训。					
如何应付过敏反应的培训。					

说明：请尽可能清楚地写下以下问题的答案。

5. 如果你想为你的工作场所设计一个食物过敏培训计划，你会**包括**什么?

6. 如果您要为您的工作场所设计食物过敏培训计划，您会**排除**什么?

7. 你的**理想**的进行食物过敏训练方式是什么? (讲座，在线课堂，手机应用程序，小册子，海报，等等）

<u>第五部分：介绍给我们关于你和你的工作场所</u>

说明：请圈出最佳答案来形容你自己。

1. 你今年几岁? 18 - 25 岁 26 - 33 岁 34 - 41 岁 42 - 49 岁 超过 50 岁

2. 你的性别是什么? 男 女 不想回答

3. 你在哪里出生? 美国 国际/在美国以外

4. 用什么语言你最适合沟通?

普通话 广东话 西班牙语 英语 其他：_____

5. 你如何描述你的英语流利程度?

很好 好 一般 不好 我不懂英语

6. 什么是您完成的最高级别的教育?

没有上学 高中学历 高中毕业生 副学士学位 学士学位 硕士 博士学位

7. 你在食品服务工作多久了?

不到 1 年 1-3 年 4-6 年 6-8 年 8 年以上

8. 你在中国餐馆工作多久了?

不到 1 年 1-3 年 4-6 年 6-8 年 8 年以上

9. 你如何最好地描述你的餐厅?

快餐店 外卖和送货 休闲全方位服务 美食全方位服务 自助餐

10. 您参与哪个工作区域? *(圈出所有适用的项目。)*

准备食材 侍候 洗碗 设备清理 非食品接触(办公室, 出纳员, 洗衣店) 其他，请明确说明: _____

11. 你每周工作几个小时? 每周 20 小时以下 每周 20 - 40 小时 每周超过 40 小时

12. 你有食品安全认证吗? 有 没有

如果有，请继续 12a。如果没有，请继续 13。

12a. 如果有，是哪一个认证?

ServSafe® | National Environmental Health Association (NEHA) | 其他，请明确说明: _____

13. 你或任何家庭成员是否有食物过敏? 有 没有

14. 去年在你的餐厅有过食物过敏的顾客吗? 有 没有 我不知道

如果有，请继续到 14a。如果没有，请继续结束。

14a. 有食物过敏的顾客平均一年有多少人会来你的餐厅?

很少 (每年 4 或更少的客户) | 少 (每年 5-8 顾客) | 偶尔 (每年 9-12 顾客) | 经常 (每年 12 以上顾客)

14b. 在食物过敏顾客访问你的餐厅的过程中，最常见的食物过敏原是什么?

黄豆 | 牛奶 | 各种坚果 | 花生

贝类 | 鱼 | 麦 | 蛋

其他：

_____

感谢您的时间!

APPENDIX H: QUESTIONNAIRE PILOT TEST EVALUATION FORM (ENGLISH)

Thank you for taking the time to answer the questionnaire about food allergy knowledge, attitudes, practices, and training among Chinese restaurant employees. Please help us improve this questionnaire by providing some additional feedback about the questionnaire you just completed.

1.	Was it easy to understand?	Yes	No
2.	Did you have to read an item more than once to understand what it was asking?	Yes	No
3.	Were the items straightforward?	Yes	No
4.	Did you leave any questions unanswered?	Yes	No
5.	Were the instructions for completing the survey clearly written?	Yes	No
6.	Were the response choices provided enough to answer the questions?	Yes	No
7.	Do you feel the responses provided gave you an appropriate way to respond?	Yes	No
8.	Were there items written where you could have answered it more than one way?	Yes	No
9.	Were there items written in such a way it seemed like there was only one way to answer?	Yes	No
10.	Were there any questions you felt were inappropriate given the purpose of the questionnaire?	Yes	No

11. Do you have any suggestions regarding the questions, instructions, or format?

12. Please share any additional feedback you may have about this questionnaire.

APPENDIX I: QUESTIONNAIRE PILOT TEST EVALUATION FORM (TRADITIONAL CHINESE)

感謝您花時間回答有關中國餐館員工食物過敏知識，態度，實踐和培訓的調查問卷。 請通過提供一些關於您剛完成的調查問卷的反饋，幫助我們改進此調查問卷。

1.	這是否很容易理解?	是	不是
2.	你是否必須多次閱讀，才能理解問題所在?	是	不是
3.	這些問題是否直截了當?	是	不是
4.	你有沒有回答的問題嗎?	是	不是
5.	完成調查的指示，是否寫得很清楚?	是	不是
6.	問卷是否提供了足夠的回答選擇，讓你回答問題?	是	不是
7.	你覺得我們所提供的回覆，給了你一個適當的回應方式	是	不是
8.	我們寫下的項目，你可以用不止一種方式來回答嗎?	是	不是
9.	我們寫下項目的方式，你似乎感覺只有一種方法可以回答?	是	不是
10.	鑑於調查問卷的目的，您覺得有什麼問題是不恰當的?	是	不是

11. 你對我們所提的問題，說明，或格式，有任何建議嗎?

12. 請與我們分享您對本調查問卷可能有的任何其他反饋。

APPENDIX J: QUESTIONNAIRE PILOT TEST EVALUATION FORM (SIMPLIFIED CHINESE)

感谢您花时间回答有关中国餐馆员工食物过敏知识，态度，实践和培训的调查问卷。 请通过提供一些关于您刚完成的调查问卷的反馈，帮助我们改进此调查问卷。

1.	这是否很容易理解?	是	不是
2.	你是否必须多次阅读，才能理解问题所在?	是	不是
3.	这些问题是否直截了当?	是	不是
4.	你有没有回答的问题吗?	是	不是
5.	完成调查的指示，是否写得很清楚?	是	不是
6.	问卷是否提供了足够的回答选择，让你回答问题?	是	不是
7.	你觉得我们所提供的回复，给了你一个适当的响应方式	是	不是
8.	我们写下的项目，你可以用不止一种方式来回答吗?	是	不是
9.	我们写下项目的方式，你似乎感觉只有一种方法可以回答?	是	不是
10.	鉴于调查问卷的目的，您觉得有什么问题是不恰当的?	是	不是

11. 你对我们所提的问题，说明，或格式，有任何建议吗?

12. 请与我们分享您对本调查问卷可能有的任何其他反馈。

APPENDIX K: DISTRIBUTOR PRODUCT LIST REQUEST EMAIL

Hello,

My name is Lilly Jan and I am a graduate student at Iowa State University researching foodservice management. I am conducting research on food allergy and Chinese restaurants and my goal is to develop a reference list of commonly found allergens in Chinese restaurant ingredients as the start of a reference database of food allergens in packaged foods. I wish to help increase food allergy awareness and to reduce food allergy reactions in Chinese restaurants and I am hoping for your help.

I am seeking a list of the most frequently ordered or purchased packaged food items by Chinese restaurants. If possible, could you provide a spreadsheet or document with a list of the items including:

- Item name and brand, e.g. Kikkoman Soy Sauce (low sodium)
- Item label's listed ingredients, if available
- Item label's allergy advisories or notes, if available

The information of any vendors or distributors participating will be kept completely confidential and information from all the participating companies will be pooled for analysis. Information connected to an individual vendor or distribution company will not be used and will not be shared with other participating companies or any reports. If your company is interested, I am happy to share with you the results of my study for your own reference. Your willingness to participate in this study is completely voluntary and you can cease participation at any point.

If you are interested in participating, please let me know via email or phone and I will be in touch! You can contact me with questions at ljan@iastate.edu or 617-903-8023. Please feel free to share this with other food distributors of Asian products who you feel may also be interested in participating.

I look forward to hearing from you!

Sincerely,

Lilly Jan
Graduate Student
Iowa State University
617-903-8023
ljan@iastate.edu

APPENDIX L: ALLERGEN TERM LIST

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Egg	Albumin	X	X	X
Egg	Apovitellin	X		
Egg	Artificial Flavoring	X		
Egg	Baked Goods	X	X	X
Egg	Bouillon			X
Egg	Breaded Foods			X
Egg	Candy			X
Egg	Canned Soup			X
Egg	Casseroles			X
Egg	Cholesterol Free Egg Substitute	X		
Egg	Coffee			X
Egg	Consommé			X
Egg	Cream Filing			X
Egg	Custard			X
Egg	Dried Egg	X		X
Egg	Dried Egg Solids	X		
Egg	Egg	X	X	X
Egg	Egg Lecithin			X
Egg	Egg Noodles			X
Egg	Egg Solids			X
Egg	Egg Substitutes		X	X
Egg	Egg Wash	X		X
Egg	Egg White	X		X
Egg	Egg Yolk	X		X
Egg	Eggbeaters®	X		
Egg	Eggnog	X	X	X
Egg	Fat Substitutes	X		
Egg	Frosting			X
Egg	Globulin	X		X
Egg	Ice Cream		X	X
Egg	Lecithin	X	X	
Egg	Livetin	X		
Egg	Lollipop			X
Egg	Lysozyme	X	X	X
Egg	Marzipan		X	X
Egg	Marshmallows		X	X
Egg	Mayonnaise	X	X	X

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Egg	Meringue	X	X	X
Egg	Meringue Powder	X	X	
Egg	Natural Flavoring	X		
Egg	Nougat	X	X	X
Egg	Ovalbumin	X	X	X
Egg	Ovoglobulin	X		
Egg	Ovomucin	X		
Egg	Ovomucoid	X		
Egg	Ovotransferrin	X		
Egg	Ovovitelia	X		
Egg	Ovovitelin			X
Egg	Ovovitellin	X		
Egg	Pasta	X		X
Egg	Powdered Eggs	X		X
Egg	Salad Dressing			X
Egg	Silici Albuminate	X		
Egg	Simplesse	X		
Egg	Soup Stock			X
Egg	Surimi	X	X	
Egg	Trailblazer	X		
Egg	Vitellin	X		
Egg	Wine			X
Fish	Anchovies		X	X
Fish	Artificial Fish		X	
Fish	Artificial Shellfish		X	
Fish	Barbeque Sauce		X	
Fish	Bass		X	X
Fish	Bouillabaisse		X	
Fish	Caesar Salad		X	X
Fish	Caesar Salad Dressing		X	X
Fish	Caponata		X	X
Fish	Catfish		X	X
Fish	Cod		X	X
Fish	Fish	X	X	
Fish	Fish Gelatin		X	
Fish	Fish Oil		X	
Fish	Fish Sticks		X	

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Fish	Flounder		X	X
Fish	Grouper		X	X
Fish	Haddock		X	X
Fish	Hake		X	X
Fish	Halibut		X	
Fish	Herring		X	X
Fish	Imitation Fish		X	
Fish	Imitation Shellfish		X	
Fish	Mahi		X	X
Fish	Perch		X	X
Fish	Pike		X	X
Fish	Pollock		X	X
Fish	Salmon		X	X
Fish	Scrod		X	X
Fish	Sea Legs			X
Fish	Sea Sticks			X
Fish	Snapper		X	X
Fish	Sole		X	X
Fish	Surimi			X
Fish	Swordfish		X	X
Fish	Tilapia		X	X
Fish	Trout		X	X
Fish	Tuna		X	X
Fish	Worcester Sauce		X	X
Milk	"Non-Dairy" Products (May Contain Casein)	X		
Milk	Ammonium Caseinate	X		
Milk	Anhydrous Milk Fat	X		
Milk	Artificial Butter	X		
Milk	Artificial Butter Flavor	X	X	X
Milk	Bacterial Cultures		X	
Milk	Baked Goods		X	
Milk	Bread			X
Milk	Butter	X	X	X
Milk	Butter Ester(S)		X	
Milk	Butter Extract	X		
Milk	Butter Fat	X	X	X
Milk	Butter Flavored Oil	X		

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Milk	Butter Oil		X	X
Milk	Butter Solids	X		
Milk	Butter, Natural	X		
Milk	Butter, Whipped	X		
Milk	Buttermilk	X	X	
Milk	Buttermilk Blend	X		
Milk	Buttermilk Solids	X		
Milk	Cakes			X
Milk	Calcium Caseinate	X		
Milk	Caramel			X
Milk	Caramel Candies		X	
Milk	Caramel Flavoring	X		
Milk	Casein	X	X	X
Milk	Casein Hydrolysate	X	X	
Milk	Caseinates (In All Forms)	X	X	X
Milk	Cereals			X
Milk	Cheese (All Types)	X	X	X
Milk	Cheese Flavor (Artificial and Natural)	X		X
Milk	Cheese Food	X		
Milk	Cheese, Cottage	X	X	
Milk	Cheese, Cream	X		
Milk	Cheese, Imitation	X		
Milk	Cheese, Soy	X		
Milk	Chewing Gum			X
Milk	Chocolate		X	X
Milk	Cold Cuts			X
Milk	Cookies			X
Milk	Crackers			X
Milk	Cream	X	X	X
Milk	Cream, Whipped	X		
Milk	Curds	X	X	X
Milk	Cured Whey	X		
Milk	Custard	X	X	X
Milk	Dairy Butter	X		
Milk	Dairy Product Solids	X		
Milk	Diacetyl		X	
Milk	Dry Milk Solids (Dms)	X	X	

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Milk	Flavoring	X		
Milk	Frozen and Refrigerated Soy Products			X
Milk	Fully Cream Milk Powder	X		
Milk	Galactose	X		
Milk	Ghee	X	X	X
Milk	Half & Half	X	X	
Milk	High Protein Flour	X		
Milk	Hot Dogs		X	
Milk	Hydrolysates	X		
Milk	Hydrolysates Casein			X
Milk	Hydrolysates Milk Protein			X
Milk	Hydrolysates Protein			X
Milk	Hydrolysates Whey			X
Milk	Hydrolysates Whey Protein			X
Milk	Hydrolyzed Casein	X		
Milk	Hydrolyzed Whey	X		
Milk	Ice Cream	X	X	
Milk	Ice Milk	X		
Milk	Iron Caseinate Magnesium Caseinate	X		
Milk	Milk, Sheep	X		X
Milk	Milk, Skim/Skimmed	X	X	
Milk	Milk, Sour	X		
Milk	Milk, Sweetened Condensed	X		
Milk	Milk, Sweetened Condensed Skim	X		
Milk	Milk, Whole	X	X	
Milk	Natural Butter Flavor	X		
Milk	Natural Flavoring	X		
Milk	Nisin		X	
Milk	Nisin Preparation	X		
Milk	Non-Dairy Products		X	X
Milk	Nonfat Dry Milk	X		
Milk	Nonfat Milk Solids	X		
Milk	Nougat	X	X	X
Milk	Potassium Caseinate	X		
Milk	Processed and Canned Eats			X
Milk	Protein Hydrolysate	X		
Milk	Pudding	X	X	X

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Milk	Quark	X		
Milk	Recaldent™	X	X	X
Milk	Rennet	X		X
Milk	Rennet Casein	X	X	X
Milk	Rice Cheese	X		
Milk	Sausages		X	
Milk	Shellfish		X	
Milk	Sherbet	X		
Milk	Simpleese® (Fat Replacer)	X		X
Milk	Skim Milk Powder	X		
Milk	Sodium Caseinate	X		
Milk	Sour Cream	X	X	
Milk	Sour Cream Solids	X	X	
Milk	Sour Cream, Imitation	X		
Milk	Sour Milk Solids	X	X	
Milk	Sweet Cream Buttermilk Powder	X		
Milk	Sweet Dairy Whey	X		
Milk	Tagatose		X	
Milk	Tuna Fish		X	
Milk	Vegetarian Cheeses with Casein	X		
Milk	Whey (In All Forms)	X	X	X
Milk	Whey Hydrolysate	X		
Milk	Whey Powder	X		
Milk	Whey Protein	X		
Milk	Whey Protein Concentrate	X		
Milk	Whey Protein Hydrolysate	X	X	
Milk	Whey Solids	X		
Milk	Whey, Acid	X		
Milk	Whey, Delactosed	X		
Milk	Whey, Demineralized	X		
Milk	Whey, Powdered	X		
Milk	Whey, Reduced Mineral	X		
Milk	Yogurt	X	X	X
Milk	Yogurt Powder	X		
Milk	Zinc Caseinate	X		
Peanut	Arachis	X		
Peanut	Arachis Hypogaea	X		

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Peanut	Arachis Oil	X	X	X
Peanut	Artificial Flavoring	X		
Peanut	Artificial Nuts	X	X	
Peanut	Artificially Flavored Nuts			X
Peanut	Baked Goods	X		X
Peanut	Beer Nuts	X	X	X
Peanut	Boiled Peanuts	X		
Peanut	Candy	X	X	X
Peanut	Chili	X	X	
Peanut	Chocolate	X		X
Peanut	Cold Pressed Peanut Oil	X	X	X
Peanut	Crumb Toppings	X		
Peanut	Crushed Nuts	X		
Peanut	Crushed Peanuts	X		
Peanut	Earth Nuts	X		
Peanut	Egg Rolls	X	X	
Peanut	Enchilada Sauce	X	X	
Peanut	Expelled Peanut Oil	X	X	X
Peanut	Expressed Peanut Oil			X
Peanut	Extruded Peanut Oil	X	X	X
Peanut	Flavoring	X		
Peanut	Fried Foods	X		
Peanut	Glazes		X	
Peanut	Goober Peas	X		
Peanut	Goobers		X	
Peanut	Gourmet Oils		X	
Peanut	Graham Cracker Crust	X		
Peanut	Ground Nuts	X	X	X
Peanut	Ground Peanuts	X		
Peanut	Hydrolyzed Peanut Protein	X		
Peanut	Hydrolyzed Plant Protein	X		
Peanut	Hydrolyzed Vegetable Protein (HVP)	X		
Peanut	Ice Cream		X	X
Peanut	Lupin		X	X
Peanut	Lupin Flour			X
Peanut	Lupine	X	X	X
Peanut	Lupine Albus	X		

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Peanut	Lupine Flour			X
Peanut	Mandelonas	X	X	
Peanut	Marinades		X	
Peanut	Marzipan	X	X	
Peanut	Mixed Nuts	X	X	X
Peanut	Mole Sauce	X		
Peanut	Monkey Nuts	X	X	
Peanut	Natural Flavoring	X		
Peanut	Nougat	X	X	
Peanut	Nu Nuts Flavored Nuts	X		
Peanut	Nunuts®			X
Peanut	Nut Butters (Soy Nut Butter, Sunflower Seed Butter)		X	
Peanut	Nut Meat	X	X	
Peanut	Nut Pieces	X	X	
Peanut	Pancakes		X	
Peanut	Peanut			X
Peanut	Peanut Butter	X	X	X
Peanut	Peanut Butter Chips	X		
Peanut	Peanut Butter Morsels	X		
Peanut	Peanut Flour	X	X	X
Peanut	Peanut Oil		X	
Peanut	Peanut Paste	X		
Peanut	Peanut Protein Hydrolysate		X	
Peanut	Peanut Sauce	X		
Peanut	Peanut Syrup	X		
Peanut	Peanuts	X		
Peanut	Pizza		X	
Peanut	Sauces (Chili Sauce, Hot Sauce, Pesto, Gravy, Mole, Salad Dressing)		X	
Peanut	Spanish Peanuts	X		
Peanut	Sunflower Seeds		X	
Peanut	Virginia Peanuts	X		
Shellfish	Abalone		X	X
Shellfish	Barnacle		X	
Shellfish	Bouillabaisse		X	X
Shellfish	Calamari		X	X
Shellfish	Cherrystone Clams		X	

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Shellfish	Clam		X	X
Shellfish	Cockle		X	X
Shellfish	Coral			X
Shellfish	Crab		X	X
Shellfish	Crawdad		X	
Shellfish	Crawfish		X	
Shellfish	Crayfish		X	X
Shellfish	Crevette		X	X
Shellfish	Crusacea		X	
Shellfish	Crustacean	X		
Shellfish	Cuttlefish		X	
Shellfish	Cuttlefish Ink		X	
Shellfish	Ecrevisse		X	X
Shellfish	Escargot		X	X
Shellfish	Fish Stock		X	X
Shellfish	Geoduck		X	
Shellfish	Glucosamine		X	
Shellfish	Krill		X	
Shellfish	Langouste			X
Shellfish	Langoustine		X	X
Shellfish	Limpet		X	
Shellfish	Limpet Lapas		X	
Shellfish	Limpet Opihi		X	
Shellfish	Littleneck Clam		X	
Shellfish	Lobster		X	X
Shellfish	Logouste		X	
Shellfish	Mollusks		X	
Shellfish	Moreton Bay Bugs		X	
Shellfish	Mussels		X	X
Shellfish	Octopus		X	X
Shellfish	Oyster		X	X
Shellfish	Periwinkle		X	
Shellfish	Pismo Clam		X	
Shellfish	Prawns		X	X
Shellfish	Quahog Clam		X	
Shellfish	Scallop		X	X
Shellfish	Scampi		X	

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Shellfish	Scampo			X
Shellfish	Sea Cucumber		X	
Shellfish	Sea Urchin		X	
Shellfish	Seafood	X		
Shellfish	Seafood Flavoring (E.G., Crab or Clam Extract)		X	X
Shellfish	Shrimp		X	X
Shellfish	Snail		X	X
Shellfish	Squid		X	X
Shellfish	Surimi		X	X
Shellfish	Tomalley		X	X
Shellfish	Turban Shell		X	
Shellfish	Whelk		X	
Soy	Artificial Flavoring	X		
Soy	Baked Goods	X	X	
Soy	Baking Mix			X
Soy	Beancurd	X		
Soy	Bread			X
Soy	Breakfast Cereal			X
Soy	Canned Broth		X	X
Soy	Canned Meat		X	X
Soy	Canned Soup		X	X
Soy	Canned Tuna		X	X
Soy	Cereals		X	
Soy	Cold-Pressed Soy Oil		X	
Soy	Cookies		X	X
Soy	Crackers		X	X
Soy	Edamame	X	X	X
Soy	Expelled Soy Oil		X	
Soy	Extruded Soy Oil		X	
Soy	Frankfurters			X
Soy	Freeze Dried Tofu (Koya Dofu)	X		
Soy	High Protein Energy Bars		X	X
Soy	High Protein Snacks		X	X
Soy	Hydrolyzed Plant Protein	X		
Soy	Hydrolyzed Soy Protein	X		
Soy	Hydrolyzed Vegetable Protein (Hvp)	X		
Soy	Infant Formula		X	

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Soy	Lecithin	X		
Soy	Low Fat Peanut Butter		X	X
Soy	Miso	X	X	X
Soy	Natto	X	X	X
Soy	Natural Flavoring	X		
Soy	Processed Meats		X	X
Soy	Sauces		X	
Soy	Shoyu (Shoyo)	X	X	X
Soy	Soy		X	X
Soy	Soy Albumin	X	X	
Soy	Soy Cheese		X	X
Soy	Soy Concentrate	X		
Soy	Soy Fiber	X	X	X
Soy	Soy Flour		X	X
Soy	Soy Formula	X		
Soy	Soy Grits	X	X	X
Soy	Soy Ice Cream		X	X
Soy	Soy Lecithin	X		
Soy	Soy Milk	X	X	X
Soy	Soy Miso	X		
Soy	Soy Nut Butter	X		
Soy	Soy Nuts	X	X	X
Soy	Soy Protein	X	X	X
Soy	Soy Protein Concentrate	X	X	X
Soy	Soy Protein Hydrolyzed		X	X
Soy	Soy Protein Isolate	X	X	X
Soy	Soy Pulp (Okara)	X		
Soy	Soy Sauce	X	X	X
Soy	Soy Sprouts	X	X	X
Soy	Soy Yogurt		X	X
Soy	Soya	X	X	
Soy	Soya Flour	X		
Soy	Soybean	X	X	
Soy	Soybean Curd	X	X	X
Soy	Soybean Flour	X		
Soy	Soybean Flour Roasted (Kinako)	X		
Soy	Soybean Granules	X	X	

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Soy	Soybean Paste	X		
Soy	Supro	X		
Soy	Tamari	X	X	X
Soy	Tempeh	X	X	X
Soy	Teriyaki Sauce	X		
Soy	Textured Soy Flour (Tsf)	X		
Soy	Textured Soy Protein (Tsp)	X		
Soy	Textured Vegetable Protein (Tvp)	X	X	X
Soy	Tofu	X	X	X
Soy	Vegetable Broth	X	X	
Soy	Vegetable Gum	X	X	
Soy	Vegetable Starch	X	X	
Soy	Yaki-Dofu (Grilled Tofu)	X		
Soy	Yuba (Bean Curd)	X		
Tree Nut	Alcoholic Beverages		X	X
Tree Nut	Alcoholic Extracts		X	
Tree Nut	Almond	X	X	X
Tree Nut	Almond Butter	X		
Tree Nut	Almond Paste	X	X	X
Tree Nut	Anacardiaceae (Cashew)	X		
Tree Nut	Anacardium Nuts	X		
Tree Nut	Anacardium Occidentale (Cashew)	X		
Tree Nut	Arecaceae (Coconut)	X		
Tree Nut	Argan Oil		X	
Tree Nut	Artificial Flavoring	X		
Tree Nut	Artificial Nuts	X	X	
Tree Nut	Baked Goods	X		
Tree Nut	Barbeque Sauces		X	
Tree Nut	Beech Nut/Beechnut	X	X	X
Tree Nut	Bertholletia Excelsa (Brazil Nut)	X		
Tree Nut	Betulaceae (Filbert/Hazelnut)	X		
Tree Nut	Black Walnut Hull Extract (Flavoring)		X	
Tree Nut	Brazil Nut	X	X	X
Tree Nut	Brazil Nut Butter	X		
Tree Nut	Brazilian Pepper		X	
Tree Nut	Burseraceae (Pili Nut)	X		
Tree Nut	Bush Nut	X		

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Tree Nut	Butter Nut	X	X	X
Tree Nut	Butyrospermum Parkii (Shea Nut)	X		
Tree Nut	Canarium Ovatum Engl. In A. Dc. (Pili Nut)	X		
Tree Nut	Candy		X	
Tree Nut	Caponata	X		
Tree Nut	Carya Illinoensis (Pecan)	X		
Tree Nut	Carya Spp. (Hickory Nut)	X		
Tree Nut	Cashew	X	X	X
Tree Nut	Castanea Pumila (Chinquapin)	X		
Tree Nut	Castanea Spp. (Chestnut [Chinese, American, European, Seguin])	X		
Tree Nut	Cereal		X	X
Tree Nut	Chestnut	X	X	X
Tree Nut	Chinquapin	X		X
Tree Nut	Chinquapin Nut		X	
Tree Nut	Chocolate		X	
Tree Nut	Christmasberry		X	
Tree Nut	Coconut	X	X	X
Tree Nut	Cocos Nucifera L. (Coconut)	X		
Tree Nut	Cold Cuts (I.E. Mortadella)		X	
Tree Nut	Cookies		X	X
Tree Nut	Corylus Spp. (Filbert/Hazelnut)	X		
Tree Nut	Crackers		X	X
Tree Nut	Energy Bar		X	
Tree Nut	Fagaceae (Chestnut)	X		
Tree Nut	Filbert	X	X	X
Tree Nut	Flavored Coffee		X	
Tree Nut	Frozen Desserts		X	
Tree Nut	Gianduja	X	X	X
Tree Nut	Ginkgo			X
Tree Nut	Ginkgo Biloba L. (Ginko Nut)	X		
Tree Nut	Ginkgo Nut	X	X	
Tree Nut	Ginkgoaceae (Ginko Nut)	X		
Tree Nut	Hazelnut	X	X	X
Tree Nut	Hazelnut Butter	X		
Tree Nut	Heartnut	X		
Tree Nut	Hickory			X

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Tree Nut	Hickory Nut	X	X	
Tree Nut	Indian Nut	X	X	
Tree Nut	Juglandaceae (Pecan/Hickory Nut)	X		
Tree Nut	Juglans Cinerea (Butternut)	X		
Tree Nut	Juglans Spp. (Botanical Name, Walnut, Butternut, Heartnut)	X		
Tree Nut	Karike Butter	X		
Tree Nut	Karite (Shea Nut)	X		
Tree Nut	Lecthidaceae (Brazil Nut)	X		
Tree Nut	Lichee		X	
Tree Nut	Lichee Nut	X		
Tree Nut	Litchi		X	
Tree Nut	Litchi Chinensis Sonn. Sapindaceae	X		
Tree Nut	Lychee Nut	X	X	X
Tree Nut	Macadamia Nut	X	X	X
Tree Nut	Macadamia Nut Butter	X		
Tree Nut	Macadamia Spp. (Macadamia Nut/Bush Nut)	X		
Tree Nut	Mandelonas	X		
Tree Nut	Marinades		X	
Tree Nut	Marizpan	X	X	X
Tree Nut	Mashuga Nuts	X		
Tree Nut	Mortadella	X		
Tree Nut	Nagai Nut	X		
Tree Nut	Nangai Nut	X	X	
Tree Nut	Natural Extracts			X
Tree Nut	Natural Flavoring	X		
Tree Nut	Natural Nut Extract	X	X	X
Tree Nut	Nougat	X		X
Tree Nut	Nu-Nuts®	X		X
Tree Nut	Nut Butters (E.G., Cashew Butter)		X	
Tree Nut	Nut Distillates		X	
Tree Nut	Nut Meal	X	X	X
Tree Nut	Nut Meat		X	
Tree Nut	Nut Milk (E.G., Almond Milk, Cashew Milk)		X	
Tree Nut	Nut Oil (Walnut Oil, Other Nut Oils)		X	
Tree Nut	Nut Paste		X	
Tree Nut	Nut Piece		X	
Tree Nut	Nutella ®	X		X
Tree Nut	Nutmeat	X		
Tree Nut	Palmae (Coconut)	X		

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Tree Nut	Pecan	X	X	X
Tree Nut	Pesto	X	X	X
Tree Nut	Pigndi	X		
Tree Nut	Pignoli		X	
Tree Nut	Pigñolia	X	X	
Tree Nut	Pignolia Nut			X
Tree Nut	Pignon		X	
Tree Nut	Pignon Nuts	X		
Tree Nut	Pili Nut	X	X	X
Tree Nut	Pine Nut	X	X	X
Tree Nut	Pineaceae (Pine Nut/Piñon Nut)	X		
Tree Nut	Pink Peppercorn		X	
Tree Nut	Piñon	X	X	
Tree Nut	Piñon Nut	X		
Tree Nut	Pinus Spp. (Pine Nut/Piñon Nut)	X		
Tree Nut	Pinyon	X		
Tree Nut	Pinyon Nut		X	
Tree Nut	Pistachio	X	X	X
Tree Nut	Pistachio Nut Nutter	X		
Tree Nut	Pistacia Vera L. (Pistachio)	X		
Tree Nut	Praline		X	
Tree Nut	Pralines	X		
Tree Nut	Proteaceae (Macadamia Nut/Bush Nut)	X		
Tree Nut	Prunus Dulcis (Almond)	X		
Tree Nut	Rosaceae (Almond)	X		
Tree Nut	Rose Pepper		X	
Tree Nut	Sapotaceae (Shea Nut)	X		
Tree Nut	Schinus		X	
Tree Nut	Shea Nut	X	X	X
Tree Nut	Shea Nut Butter	X		
Tree Nut	Sheanut	X		
Tree Nut	Vitellaria Paradoxa C.F. Gaertn. (Shea Nut)	X		
Tree Nut	Walnut	X	X	X
Tree Nut	Walnut (English, Persian, Black, Japanese, California)	X		
Tree Nut	Walnut Hull Extract (Flavoring)		X	
Wheat	Ale		X	X
Wheat	Artificial Flavoring	X		

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Wheat	Baked Goods		X	
Wheat	Baked Products			X
Wheat	Baking Mixes		X	X
Wheat	Batter-Fried Foods		X	X
Wheat	Beer		X	X
Wheat	Bread (Any Type)	X		
Wheat	Breadcrumbs	X	X	X
Wheat	Breaded Foods		X	X
Wheat	Breakfast Cereals		X	X
Wheat	Bulgur	X	X	X
Wheat	Candy		X	X
Wheat	Caramel Color	X		
Wheat	Cereal Extract	X	X	X
Wheat	Club Wheat		X	
Wheat	Couscous	X	X	X
Wheat	Cracker Meal	X	X	
Wheat	Crackers		X	X
Wheat	Dextrin	X		
Wheat	Durum		X	
Wheat	Durum Wheat		X	X
Wheat	Einkorn	X	X	X
Wheat	Emmer	X	X	X
Wheat	Farina	X	X	X
Wheat	Farro	X		
Wheat	Flour, All Purpose	X	X	X
Wheat	Flour, Atta	X		
Wheat	Flour, Bread	X	X	
Wheat	Flour, Bromated	X		
Wheat	Flour, Cake	X	X	X
Wheat	Flour, Club	X		
Wheat	Flour, Common	X		
Wheat	Flour, Durum	X	X	X
Wheat	Flour, Einkorn	X		
Wheat	Flour, Emmer	X		
Wheat	Flour, Enriched	X	X	X
Wheat	Flour, Farina	X		
Wheat	Flour, Graham	X	X	X

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Wheat	Flour, Ground	X		
Wheat	Flour, High Gluten	X	X	X
Wheat	Flour, High Protein	X	X	X
Wheat	Flour, Instant		X	
Wheat	Flour, Instant Pastry	X		
Wheat	Flour, Kamut	X		
Wheat	Flour, Maida	X		
Wheat	Flour, Pastry		X	X
Wheat	Flour, Phosphated	X		
Wheat	Flour, Plain	X		
Wheat	Flour, Self-Rising	X	X	
Wheat	Flour, Semolina	X		
Wheat	Flour, Soft Wheat	X	X	
Wheat	Flour, Spelt	X		
Wheat	Flour, Steel Ground	X	X	
Wheat	Flour, Stone	X		
Wheat	Flour, Stone Ground		X	
Wheat	Flour, Triticale	X		
Wheat	Flour, Triticum	X		
Wheat	Flour, Unbleached	X		
Wheat	Flour, Wheat			X
Wheat	Flour, White	X		
Wheat	Flour, Whole Wheat	X	X	
Wheat	Food Starch	X		
Wheat	Frankfurters			X
Wheat	Fu	X		
Wheat	Fu Gluten	X		
Wheat	Gelatinized Starch	X	X	
Wheat	Glucose Syrup	X	X	
Wheat	Hot Dog		X	
Wheat	Hydrolyzed Vegetable Protein (Hvp)	X		
Wheat	Hydrolyzed Wheat Protein		X	
Wheat	Ice Cream		X	
Wheat	Ice Cream Products			X
Wheat	Imitation Crab Meat		X	
Wheat	Kamut®	X	X	X
Wheat	Khorasan Wheat	X		

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Wheat	Malt	X		
Wheat	Malt Extract	X		
Wheat	Maltodextrin	X		
Wheat	Marinara Sauce		X	
Wheat	Matzo (Matzoh, Matzah, Matza)	X	X	
Wheat	Matzo (Matzoh, Matzah, Matza) Meal	X		
Wheat	Modified Food Starch	X	X	
Wheat	Modified Starch	X	X	
Wheat	Monosodium Glutamate (Msg)	X		
Wheat	Natural Flavoring	X		
Wheat	Noodles	X		
Wheat	Oats	X		
Wheat	Pasta	X	X	
Wheat	Potato Chips		X	
Wheat	Processed Meats		X	X
Wheat	Rice Cakes		X	
Wheat	Salad Dressings		X	X
Wheat	Sauces		X	X
Wheat	Seitan		X	
Wheat	Semolina		X	X
Wheat	Shoyu	X		
Wheat	Soups		X	X
Wheat	Soy Sauce	X	X	X
Wheat	Spelt	X	X	X
Wheat	Sprouted Wheat	X	X	X
Wheat	Surimi	X	X	X
Wheat	Tabbouleh	X		
Wheat	Tamari	X		
Wheat	Teriyaki Sauce	X		
Wheat	Textured Vegetable Protein	X		
Wheat	Triticale	X	X	X
Wheat	Triticum	X		
Wheat	Turkey Patties		X	
Wheat	Vegetable Gum	X		
Wheat	Vegetable Starch	X	X	
Wheat	Vital Gluten	X		X
Wheat	Vital Wheat Gluten	X	X	

APPENDIX L. CONTINUED

Allergen	Term	Source		
		Asthma & Allergy Foundation of America	Food Allergy Research & Education	Consortium of Food Allergy Research
Wheat	Wheat	X		
Wheat	Wheat Berries	X		
Wheat	Wheat Bran	X	X	X
Wheat	Wheat Bran Hydrolysate		X	
Wheat	Wheat Germ	X	X	X
Wheat	Wheat Germ Oil	X	X	
Wheat	Wheat Gluten	X	X	X
Wheat	Wheat Grass	X	X	
Wheat	Wheat Malt		X	X
Wheat	Wheat Protein Isolate	X	X	
Wheat	Wheat Sprouts	X	X	
Wheat	Wheat Starch	X	X	X
Wheat	Whole Wheat	X		
Wheat	Whole Wheat Berries		X	X
Wheat	Whole Wheat Bread	X		

APPENDIX M: FOOD ALLERGEN REFERENCE DATABASE FOR PACKAGED FOODS IN CHINESE RESTAURANTS

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
BATTER MIX										
Golden Dipt®	Batter Mix	Yellow Corn Flour, Bleached Wheat Flour, Salt, Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate), Dextrose, Guar Gum, Nonfat Milk, Spices, And Eggs.		X			X	X		
Golden Dipt®	Tempura Batter Mix 6/5Lb	Enriched Wheat Flour (Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, And Folic Acid), Rice Flour, Cornstarch, And Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate, And Monocalcium Phosphate).		X						
Kikkoman®	Batter Mix Tempura 6-5#	Bleached Wheat Flour, Sugar, Leavening (Sodium Bicarbonate, Sodium Aluminum Phosphate, Sodium Acid Pyrophosphate), Salt, Nonfat Dried Milk, Yellow Corn Flour, Dried Whole Eggs, Xanthan Gum, Colored with Oleoresin Turmeric.		X			X	X		
Showa	Tempura Batter Mix 20Kg	Wheat Flour, Potato Starch, Egg Yolk, Shortening.		X			X			
Wel-Pac	Gold Tempura Batter Mix 40#	Wheat Flour, Corn Starch, Sodium Bicarbonate, Sodium Acid Pyrophosphate, Potassium Alum, Soy Lecithin, Riboflavin.	X	X						
READY TO COOK CHICKEN										
InnovAsian® Cuisine	Tempura Battered Chicken Thigh	Chicken Thigh Meat, Water, Cornstarch, Bleached Enriched Flour (Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Contains Less Than 2% Of Dextrin, Egg Whites, Egg Yolks, Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate, Monocalcium Phosphate), Modified Potato Starch, Nonfat Dry Milk, Rice Flour, Salt, Sodium Phosphate, Xanthan Gum. Cooked in Vegetable Oil.		X			X	X		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK CHICKEN (continued)										
Pierce Chicken®	Tempura Battered Breast Chunks	Tempura Chicken Breast Mean Chunks with Rib Meat Contains Up To 10% Solution Of Water Modified Food Starch Salt And Sodium Phosphates. Battered With: Batter Mix [Yellow Corn Flour, Bleached Wheat Flour, Modified Corn Starch, Salt, Leavening (Sodium Aluminum Phosphate, Sodium Bicarbonate), Dried Whey, Spices, Garlic Powder, Onion Powder, Dried Whole Eggs], Water, Corn Oil. Predusted with: Bleached Wheat Flour, Leavening (Sodium Bicarbonate, Sodium Aluminum Phosphate, Monocalcium Phosphate), Nonfat Dry Milk, Salt, Dried Whey, Flavor (Maltodextrin, Salt, Sugar, Silicon Dioxide, Garlic Powder, Spices, Soybean Oil, Natural Flavor, Extractives Of Turmeric, Hydrolyzed Corn Gluten), Garlic Powder, Onion Powder, Torula Yeast. Battered With: Water, Yellow Corn Flour, Bleached Wheat Flour, Modified Corn Starch, Salt, Leavening (Sodium Aluminum Phosphate, Sodium Bicarbonate), Dried Whey, Spices, Garlic Powder, Onion Powder, Flavor (Maltodextrin, Salt, Sugar, Silicon Dioxide, Garlic Powder, Spices, Soybean Oil, Natural Flavor, Extractives of Turmeric, Hydrolyzed Corn Gluten).	P	X	P	P	X	X		
Royal	Tempura Chicken	Chicken Breast Meat, Water, Bleached Enriched Flour (Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Cornstarch. Contains Less Than 2% Of Egg Whites, Garlic Powder, Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate, Monocalcium Phosphate), Malted Barley Flour, Rice Flour, Salt, Sodium Phosphate, Wheat Starch. Fully Cooked in Vegetable Oil.		X			X			

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK CHICKEN (continued)										
Royal	Tempura Dark Meat	Chicken Dark Meat, Water, Bleached Enriched Flour (Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Cornstarch. Contains Less Than 2% Of Egg Whites, Garlic Powder, Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate, Monocalcium Phosphate), Malted Barley Flour, Rice Flour, Salt, Sodium Phosphate, Wheat Starch. Fully Cooked in Vegetable Oil		X			X			
Tyson Red Label®	Chicken Breast Nugget Tempura Battered Raw	Boneless, Skinless Chicken Breast with Rib Meat Containing: Up To 25% Of A Solution Of Water, Soybean Oil, Modified Food Starch, Salt, Garlic Powder, Sodium Phosphates, Spice (Salt And Extractives Of Black Pepper). Battered With: Water, Bleached Wheat Flour, Modified Corn and Wheat Starch, Palm Oil, Salt, Garlic Powder, Onion Powder. Predusted with: Corn Starch, Wheat Flour, Modified Food Starch, Yellow Corn Flour, Salt, Dextrose, Leavening (Sodium Aluminum Phosphate, Sodium Bicarbonate). Breading Set in Vegetable Oil.	P	X						
OIL/SHORTENING										
Admiration® Foods	Canola Oil	Canola Oil								
Admiration® Foods	Magic Fry-Zz Clear Liquid Shortening	Vegetable Oil (Soybean And/Or Canola), TBHQ, Citric Acid (To Preserve Freshness) And Methyl Silicone, An Anti-Foam Agent Added.	P							

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
OIL/SHORTENING (continued)										
Admiration® Foods	Creamy Liquid Shortening (35Lb)	Soybean Oil, Fully Hydrogenated Soybean Oil, TBHQ Added to Preserve Freshness. Dimethylpolysiloxane, An Anti-Foaming Agent, Added.	P							
La Spagnola® Brand	Vegetable Oil	Soybean Oil	P							
Oasis Foods	Peanut Delight	Canola And/Or Soybean Oil, Peanut Oil, TBHQ (To Protect Flavor), Dimethylpolysiloxane (Anti-Foaming Agent)	P		P					
READY TO COOK CRAB RANGOON										
Amoy®	Crab Rangoon	Filling: Cream Cheese [Pasteurized Milk & Cream, Cheese Cultures, Salt, Stabilizers (Carob Bean And/Or Xanthan And/Or Guar Gums)], Crabmeat [Crab & Salt], Sugar, Soy Sauce (Water, Wheat, Soybeans, Salt, Sodium Benzoate: Less Than 0.1% Of 1% As A Preservative), Scallions, Granulated Garlic, White Pepper. Wrapper: Wheat Flour, Water, Salt, Eggs, Cornstarch, Soy Lecithin, FD&C Yellow No.5, Sodium Benzoate. Fried in Soybean Oil.	X	X			X	X		X
Golden Tiger®	Cream Cheese Wonton	Filling: Cream Cheese [Pasteurized Milk and Cream, Cheese Culture, Salt, Stabilizers (Carob Bean And/Or Xanthan And/Or Guar Gums)], Modified Food Starch. Wrapper: Wheat Flour, Water, Salt, Eggs, Cornstarch, Soy Lecithin, Beta Carotene, Sodium Benzoate, Fried In: Refined Soybean Oil.	X	X			X	X		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK CRAB RANGOON (continued)										
Minh®	Crab Rangoon	Imitation Crabmeat: Surimi (Fish Protein Of Pollock, Whiting, Cod, And/Or Threadfin Bream, Water, Sugar, Polyphosphate [E-451I & E450III], Corn/Wheat Starch, Tapioca Starch, Sorbitol, Sugar, Soya Bean Oil, Salt, Mirin, Crab Flavors & Extracts, Calcium Carbonate, Carmine [E-120] And Paprika A[E-160C] Color), Cream Cheese (Pasteurized, Cultured Milk And Cream, Salt, Stabilizers [Xanthan And/Or Carob Bean And/Or Guar Gums]), Shallots, Sesame Oil (Sesame Oil), Sherry Wine (Contains Sulfites), Bread Crumbs (Wheat Flour, Contains 2\% Or Less Of The Following: Sugar, Yeast, Soybean Oil, Salt), Crab Base (Cooked Crab Meat, Salt, Maltodextrin, Sugar, Potato Flour, Dextrose, Onion Powder, Hydrolyzed Wheat Protein, Crab Extract, Garlic Powder, Spices, Disodium Inosinate, Disodium Guanylate, Yeast Extract, Sunflower Oil, And Citric Acid), Chives, Black Pepper, Egg Roll Wrapper (Flour [Bleached Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid, Enzyme], Water, Egg Shade Color [Water, Propylene Glycol, FD&C #5, Propylparaben {As A Preservative} And FD&C Red #40], Dried Whole Eggs, Salt, Corn Starch, Calcium Propionate, Vegetable Shortening [Partially Hydrogenated Soybean And Cotton Seed Oil With Methyl Silicone]), Egg Whites & Water, Citric Acid, Triethyl Citrate. Fried in Soybean Oil.	X	X			X	X	X	X

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK CRAB RANGOON (continued)										
Phillips[tm]	Crab Rangoon	Wrapper (Wheat Flour, Water, Coconut Oil, Salt), Cream Cheese (Milk, Cream Salt, Vegetable Gum [Guar Gum, Locust Bean Gum], Cultures), Crab Meat (Crab Meat, Sodium Acid Pyrophosphate [To Prevent The Formation Of Struvite Crystals]), Green Onion, Bread Crumb (Wheat Flour, Salt, Sugar, Palm Oil, Yeast, Soy Flour, Spice Extract [Rosemary]), Modified Tapioca Starch, Garlic, Soy Sauce (Water, Salt, Soybean, White Sugar, Wheat Flour, Preservative [Sodium Benzoate]), Flavor Enhancer Disodium 5' Inosinate, Disodium 5' Guanylate]), Worcestershire Sauce (Malt Vinegar, Spirit Vinegar, Molasses, Sugar, Salt, Anchovies, Tamarinds, Onions, Garlic, Spices, Flavorings), Lime Juice, Oyster Sauce (Water, Sugar, Salt, Oyster Extractives, Modified Corn Starch, Wheat Flour, Color [Ammonia Caramel]), Seasoning Sauce (Water, Salt, Wheat, Sugar, Caramel, Acetic Acid, Disodium Inosinate And Disodium Guanylate, Seasoning, Dextrose), Garlic Powder, White Pepper, Hot Sauce (Vinegar, Red Pepper, Salt), Ginger, Crab Powder.	X	X				X	X	X

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
Seven Seas Foods[tm]	Crab Rangoon	Filling (Cream Cheese [Pasteurized, Cultured Milk and Cream, Salt, Stabilizers {Xanthan And/Or Carob Bean And/Or Guar Gum}]. Crab, Surimi [Whiting, Water, Wheat Starch, Egg Whites, Sugar, Sorbitol, Modified Food Starch, Wheat Gluten, Salt, Soybean Oil, Snow Crab, Natural And Artificial Flavors, Sodium Tripolyphosphate, Tetrasodium Pyrophosphate, Mirin Wine, Paprika, Color Added], Scallions, Pure Cane Sugar, Soy Sauce [Water, Wheat, Soybeans, Salt, Sodium Benzoate {Less Than 1% As A Preservative}], Ground Garlic, Ground White Pepper, Crab Extract [Cooked Crab, Salt, Flavoring, Yeast Extract, Maltodextrin {From Corn}, Modified Food Starch, Butter, Tomato Paste {Tomato Paste, Salt, Spices, Natural Flavors, Citric Acid}, Sugar, Paprika]). Wrapper (Flour, Water, Corn Starch, Pasteurized Eggs, Salt, And Sodium Benzoate), Soybean Oil.	X	X	P	P	X	X		X
DUCK SAUCE										
Ambrosia®	Duck Sauce 4/1Gal	Water, Corn Syrup, Corn Starch Modified, Apricots (Sulfited), Salt, Vinegar, Citric Acid, Caramel Color, 1/10 Of 1% Sodium Benzoate, FD&C Yellow #5, #6, FC&C Red #40.		P						
Dai Day®	Duck Sauce 6/40Oz	Apricots, Corn Syrup, High Fructose Corn Syrup, Modified Corn Starch, Vinegar, Salt, Water, Potassium Sorbate and Sodium Benzoate (As Preservatives), Spice and Natural Flavor, Contains Sulfites.	P	P	P	P	P	P		
Dynasty®	Chinese Duck Sauce 12/7Z	Corn Syrup, Water, Apricots with Pulp and Juice, White Distilled Vinegar, Sugar, Propylene Glycol, Salt, Onion, Xanthan Gum, Wheat, Soybeans, Garlic, Citric Acid, Sodium Benzoate And Sodium Metabisulfite (Preservatives), Ginger, Ascorbic Acid, Calcium Disodium EDTA (Retains Product Freshness).	X	X						

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
DUCK SAUCE (continued)										
Kari-Out Co.	Duck Sauce 4/1Gal	Water, High Fructose Corn Syrup And/Or Sucralose, Corn Starch Modified, Apricots (Sulfited), Salt, Vinegar, Citric Acid, Caramel Color, 1/10 Of 1% Sodium Benzoate, FD&C Yellow #5, #6, FC&C Red #40.		P						
WY Industries	Duck Sauce	Water, Corn Syrup, High Fructose Corn Syrup, Peaches/Apricots, Starch, Salt, Vinegar, Caramel Color, Garlic, Onion, Pepper, FD&C Red #40, FD&C Yellow #6, 1/10 Of 1% Sodium Benzoate.		P						
READY TO COOK EGG ROLL										
Golden Tiger®	Vegetable Egg Roll	Enriched Bleached Flour (Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Cabbage, Water, Enriched Durum Flour (Wheat Flour, Niacin, Ferrous Sulfate, Thiamin Mononitrate [Vitamin B1], Riboflavin [Vitamin B2], Folic Acid), Carrot, Celery, Soybean Oil, Onion, Cooked Enriched Rice (Enriched With Niacin, Iron, Thiamine Mononitrate, Folic Acid), Broccoli, Contains Less Than 2% Of: Dried Whole Eggs, Vital Wheat Gluten, Spice, Garlic Powder, Shiitake Mushroom Powder, Vermicelli (Green Mung Beans, Water), Dehydrated Soy Sauce (Soy Sauce [Wheat, Soybeans, Salt], Maltodextrin, Salt), Sugar, Soy Sauce (Water, Soybeans, Salt, Wheat Flour), Flavor Enhancer (Yeast Extract, Natural Flavor), Modified Corn Starch, Salt, Sesame Seed Oil, Cottonseed Oil.	X	X	P	P	X	P		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK EGG ROLL (continued)										
InnovAsian® Cuisine	Egg Roll Pork Veg 60/3Oz	Cabbage, Pork, Enriched Bleached Flour (Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, Onion, Enriched Durum Flour (Durum Flour, Niacin, Ferrous Sulfate, Thiamine Mononitrate [Vitamin B1], Riboflavin [Vitamin B2], Folic Acid), Textured Vegetable Protein (Soy Flour, Zinc Oxide, Niacinamide, Ferrous Sulfate, Copper Gluconate, Vitamin A Palmitate, Calcium Pantothenate, Thiamine Mononitrate[B1], Pyridoxine Hydrochloride [B6], Riboflavin [B2], Cyanocobalamin [B12]), Carrot, Celery, Contain Less Than 2% Of: Natural Flavor Enhancer (Autolyzed Yeast Extract, Natural Flavor), Sugar, Spice, Salt, Wheat Protein, Dried Whole Eggs, Cottonseed Oil. Pre-Fried in Vegetable Oil.	X	X	P	P	X	P		
InnovAsian® Cuisine	Vegetable Egg Roll	Cabbage, Enriched Flour ([Bleached Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid], Calcium Propionate, Malted Barley Flour), Celery, Water, Carrots, Bok Choy, Water Chestnuts, Enriched Durum Flour (Wheat Flour, Niacin, Ferrous Sulfate, Thiamine Mononitrate, Riboflavin, Folic Acid), Bamboo Shoots, Contains 2% Or Less Of: Salt, Vegetable Oil (Cottonseed and/or Canola Oil), Sugar, Modified Food Starch, Spice, Roasted Garlic, Wheat Gluten, Toasted Sesame Oil, Dried Onion, Maltodextrin, Natural Flavor, Disodium Inosinate, Disodium Guanylate, Dried Whole Eggs, Cornstarch. Fried in Vegetable Oil (Cottonseed and/or Canola Oil)	P	X	P	P	X	P		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK EGG ROLL (continued)										
Minh®	Pork & Vegetable Egg Roll 3Oz	Filling: Cabbage, Pork, Carrots, Celery, Textured Vegetable Protein Product (Textured Soy Flour, Zinc Oxide, Niacinamide, Ferrous Sulfate, Copper Gluconate, Vitamin A Palmate, Calcium Pantothenate, Thiamine Mononitrate [B1], Pyridoxine Hydrochloride [B6], Riboflavin [B2], And Cyanocobalamin [B12]), Onions, Salt, Sugar, Anchovy Flavored Fish Sauce (Anchovy Fish Extract, Salt, Sugar), Monosodium Glutamate, Spice. Crust: Enriched Bleached Flour ([Wheat Flour, Malted Barley Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid], Calcium Propionate [Preservative]), Water, Enriched Durum Flour (Wheat Flour, Niacin, Ferrous Sulfate, Thiamine Mononitrate, Riboflavin, Folic Acid), Salt, Cottonseed Oil, Dried Whole Eggs, Wheat Gluten. Fried in Cottonseed Oil.	X	X			X		X	

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
Wing Hing®	Pork Egg Roll 3Oz	Filling – Cooked Pork (Pork, Soy Sauce [Water, Wheat, Soybeans, Salt, Sodium Benzoate, Less Than 1/10 Of 1% As A Preservative], Chili Oil [Soybean Oil, Chili Pepper Powder], Ginger, Contains Less Than 1% Of Garlic, Rice Wine, Salt, Black Pepper), Prepared Cabbage (Cabbage, Salt), Green Beans, Prepared Carrot (Carrot, Sugar, Salt), Bamboo Shoots, Water, Prepared Sauce (Sweet & Sour [Water, High Fructose Corn Syrup, Pineapple Tidbits {Pineapple, Pineapple Juice, Citric Acid}, Diced Tomatoes {Tomatoes, Tomato Juice, Citric Acid, Calcium Chloride}, Vinegar, Modified Cornstarch, Hydrolyzed Soy Protein, 2% Or Less Of Brown Sugar, Dehydrated Onion, Dehydrated Green Bell Pepper, Spices, Lemon Powder], Sweet Chili Sauce [Sugar, Water, Pickled Red Chili, Vinegar, Garlic, Salt, Xanthan Gum], Garlic Powder, Red Bell Pepper, Distilled Vinegar, Sugar), And Textured Soy Flour. Contains 2% Or Less of Salt, Green Onion, Modified Corn Starch and Seasoning (Corn Syrup Solids, Cane Sugar, Vinegar Powder, Soy Sauce Powder, Dry Onion And Garlic, Chili Powder, Ginger Powder And Natural Flavor). Wrapper – Enriched Wheat Flour (Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, Contains 2% Or Less Of Salt, Egg Yolk, Sodium Benzoate (A Preservative), And Dusted With Cornstarch. Par Fried in Canola and/or Cottonseed Oil.	X	X	P	P	X	P		
FISH SAUCE										
Lucky Brand	Fish Sauce	Anchovy Extract, Salt, Sugar, Water							X	
Megachef	Premium Fish Sauce	Anchovy, Sea Salt, Sugar, Fructose.							X	

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
FISH SAUCE (continued)										
Squid® Brand	Fish Sauce	Anchovy Extract, Salt, Sugar							X	
Three Crabs Brand®	Fish Sauce	Anchovy Extract, Salt, Water, Fructose & Hydrolyzed Vegetable Protein	P	P	P				X	
Tiparos®	Thai Fish Sauce	Anchovy Extract, Salt, Sugar, Water.							X	
GENERAL TSO SAUCE										
Foothill Farms®	General Tso's Sauce Mix	Sugar, Modified Food Starch, Brown Sugar, Soy Sauce (Wheat, Soybeans, Salt), Maltodextrin, Molasses, Salt, Yeast Extract, Dehydrated Vegetables (Onion, Garlic, Red Bell Pepper), Natural Flavor, Contains 2% Or Less Of Each Of The Following: Color (Caramel Color, Annatto Extract), Silicon Dioxide (Anticaking), Citric Acid, Xanthan Gum, Safflower Oil, Garlic Extract, White Distilled Vinegar.	X	X	P	P	P	P		
Frank's Redhot®	General Tso Sauce	Sugar, Distilled Vinegar, Soy Sauce (Water, Wheat, Soybean, Salt), Water, Modified Food Starch, Tomato Paste, Salt, Garlic Powder, Citric Acid, Spices, Onion Powder, Sodium Benzoate (As A Preservative).	X	X						
Iron Chef^{tm}	General Tso's Sauce & Glaze	Sugar, Naturally Brewed Soy Sauce (Water, Wheat, Soybeans, Sea Salt), Water, Vinegar, Food Starch (Modified), Tomato Paste, Fresh Garlic, Dried Garlic, Red Peppers, Expeller Pressed Soybean Oil, Dried Minced Onions. No Msg.	X	X						

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
GENERAL TSO SAUCE (continued)										
JTM Food Group®	General Tso's Sauce	Sugar, Water, Soy Sauce Powder (Soy Sauce [Soybeans, Wheat, Salt], Maltodextrin), Brown Sugar, Modified Food Starch, Vinegar, Vegetable Oil (Soybean And Sesame Oils), Dehydrated Garlic, Onion Powder, Spices, Chicken Base (Roasted Mechanically Separated Chicken, Salt, Sugar, Hydrolyzed Wheat Gluten, Chicken Fat, Onion Powder, Disodium Inosinate, Disodium Guanylate, Extractive Of Turmeric, Spice Extractive), Paprika Extract.	X	X						
Minor's®	General Tso's RTU Sauce	Water, Sugar, Soy Sauce (Water, Wheat, Soybeans, Salt, Sodium Benzoate [Preservative]), Corn Syrup, Red Wine Vinegar, High Fructose Corn Syrup, Modified Corn Starch, 2% Or Less of Ginger Puree (Ginger, Water, Citric Acid), Salt, Garlic Puree, Molasses, Spices, Xanthan Gum, Paprika Extract, Potassium Sorbate (Preservative).	X	X						
HOISIN SAUCE										
Kikkoman®	Hoisin Sauce (5Lb.)	Sugar, Water, Miso (Water, Soybeans, Rice, Salt, Alcohol), Plum Puree, Naturally Brewed Soy Sauce (Water, Wheat, Soybeans, Salt), Garlic, Vinegar, Caramel Color, Modified Corn Starch, Fermented Wheat Protein, Salt, Spices, Sodium Benzoate: Less Than 1/10 Of 1% As A Preservative, Xanthan Gum, Citric Acid, Natural Flavors.	X	X	P	P	P	P		
Koon Chun® Sauce Factory	Hoisin Sauce	Sugar, Soybean Paste (Water, Soybeans, Salt, Wheat Flour), Rice Vinegar, Salted Garlic (Garlic, Salt), Sesame Seed Oil, Salted Chili (Chili, Water, Salt), Spices	X	X						

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
HOISIN SAUCE (continued)										
Lee Kum Kee[tm]	Hoisin Sauce	Sugar, Water, Soybeans, Salt, Sweet Potato, Modified Corn Starch, Sesame Seeds, Garlic, Wheat Flour, Chili Peppers, Spices, Caramel Color, Acetic Acid, FD&C Red Color No. 40.	X	X						
Lee Kum Kee[tm]	Hoisin Sauce (Gluten Free)	Sugar, Water, Salt, Modified Corn Starch, Distilled Vinegar, Soy Flour, Garlic, Contains Less Than 2% Of Soybeans, Caramel Color, Sesame Oil, Xanthan Gum, Spices, Citric Acid.	X	P						
Roland®	Hoisin Sauce 5Lb	Sugar, Water, Soybeans, Salt, Modified Starch, Vinegar, Garlic, Sesame Paste, Lemon, Spices, Caramel Coloring, Chili, Citric Acid, Xanthan Gum.	X	P						
IMITATION CRAB										
High Liner Foods®	Flake Style Imitation Crabmeat 4/2.5Lb	Pollock, Water, Wheat Starch, Corn Starch, Sugar, Sorbitol, Contains 2% Or Less Of: Salt, Mirin Wine, Soybean Oil, Natural And Artificial Crab Flavor, Calcium Carbonate, Egg Whites, Sodium Tripolyphosphate (To Retain Moisture), Tetrasodium Pyrophosphate, Color Additives (Carmine, Paprika).	X	X			X		X	X
Osaki Brand	Crab Imitation Stick Kanikama Fz 20/1.1 Lb	Minced Fish (Alaskan Pollack Etc.), Wheat Starch, Salt, Crab Extract Flavor, Seasoning (Monosodium Glutamate), Sugar, Dried Egg White, Annatto Color, Carmine Color, Paprika Color, Emulsifier.		X			X		X	X
Shirakiku Brand®	Imitation Crab Sticks 500G	Fish Meat (Threadfin Bream, Lizardfish), Water, Modified Tapioca Starch, Egg White (Liquid), Salt, Sweet Flavoring (Glucose Syrup, Lactic Acid, Acetic Acid, Yeast Extract, Caramel, Water), Sorbitol, Crab Flavor, Monosodium Glutamate, Pasteurized Whole Egg (Liquid), Sugar, Natural Color (Cochineal, Paprika).		P			X	P	X	P

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
IMITATION CRAB (continued)										
Trident®	Surimi Imitation Crabmeat Flake Style, 2.5Lb	Fish Protein (Pollock, Cod And/Or Whiting), Water, Corn Starch, Egg Whites, Sorbitol, Modified Food Starch, Sugar, Contains 2% Or Less Of The Following: Wheat Gluten, Salt, Soybean Oil, Natural And Artificial Flavors, Sodium Tripolyphosphate, Tetrasodium Pyrophosphate, Color Added.	X	X			X		X	X
Trident®	Surimi Imitation Crabmeat Shreds	Pollock, Water, Sugar, Soybean Oil, Egg Whites, Wheat Starch, Salt, Potato Starch, Sorbitol, Modified Food Starch, Artificial Crab Flavor, Mirin Wine (Sake, Sugar, Salt, Water, Yeast Extract), Sodium Tripolyphosphate, Tetrasodium Pyrophosphate, Paprika Oleoresin, Carmine, Corn Syrup, Soy Lecithin.	X	X			X		X	
ORANGE SAUCE										
JTM Food Group®	Orange Sauce, Hunan Style	Water, Sugar, Orange Juice Concentrate, Soy Sauce Powder (Soy Sauce [Soybeans, Wheat, Salt], Maltodextrin), Corn Syrup Solids, Vinegar, Brown Sugar, Modified Food Starch, Concentrated Pineapple Juice, Dehydrated Garlic, Onion Powder, Spices	X	X						
Kikkoman®	Orange Sauce	High Fructose Corn Syrup, Corn Syrup, Water, Naturally Brewed Soy Sauce (Water, Wheat, Soybeans, Salt), Vinegar, Modified Corn Starch, Alcohol, Orange Juice Concentrate, Dehydrated Onion, Natural Flavor, Citric Acid, Xanthan Gum, Sodium Benzoate: Less Than 1/10 Of 1% As A Preservative, Spices, Garlic Powder.	X	X	P	P	P	P		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
ORANGE SAUCE (continued)										
Lee Kum Kee[tm]	Sauce For Orange Chicken (General Tso's Chicken)	Sugar, Water, High Fructose Corn Syrup, Soy Sauce (Water, Soybeans, Salt, Wheat Flour, Sodium Benzoate), Orange Juice Concentrate, Modified Corn Starch, Contains Less Than 2% Of Citric Acid, Salt, Sodium Citrate, Onion Powder, Sesame Oil, Spices, Sesame Seeds, Garlic Powder, Chili Peppers, Xanthan Gum, Natural Orange Flavor, Caramel Color, Cochineal, Beta-Carotene, Soybean Oil, Rice Bran Oil, Canola Oil, Natural Flavors (Milk), Sodium Benzoate Added As A Preservative.	X	X	P	P	P	X		
Minh®	Orange Sauce, Less Sodium	Water, Orange Juice Concentrate, Sugar, Vinegar, Brown Sugar, Soy Sauce (Water, Wheat, Soybeans, Salt, Lactic Acid, And Less Than 0.10% Sodium Benzoate as A Preservative), Modified Food Starch, Contains 2% Or Less: Toasted Sesame Oil, Natural Flavor, Xanthan Gum, Spice, Citric Acid, Garlic Powder, Oleoresin Paprika, Salt, Yeast Extract.	X	X	P	P	P	P		
Minor's®	Orange Sauce Zesty	Corn Syrup, Water, High Fructose Corn Syrup, Soy Sauce (Water, Wheat, Soybeans, Salt, Less Than 1% Sodium Benzoate as A Preservative), White Distilled Vinegar, Modified Cornstarch, 2% Or Less Of Garlic, Toasted Sesame Oil, Concentrated Orange Juice, Spices, Extractives Of Annatto, Canola Oil, Xanthan Gum, Salt.	X	X						

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
OYSTER SAUCE										
Kikkoman®	Oyster Flavored Sauce, No Added Msg, Green Label, 5 LB	Water, Sugar, Salt, Oyster Juice Concentrate [Oyster (Molluscan Shellfish), Water, Salt], Modified Corn Starch, Caramel Color, Yeast Extract, Oyster Extract (Molluscan Shellfish).		P						
Lee Kum Kee[tm]	Oyster Flavored Sauce, Kum Chun, 5 LB	Water, Sugar, Salt, Modified Corn Starch, Oyster Extractives (Oyster, Water, Salt), Monosodium Glutamate, Wheat Flour, Caramel Color, Sodium Benzoate Added as A Preservative.		X						
Lee Kum Kee[tm]	Oyster Flavored Sauce, Panda Brand, 5 LB	Water, Sugar, Salt, Oyster Extractives (Oyster, Water, Salt), Monosodium Glutamate, Modified Corn Starch, Wheat Flour, Caramel Color.		X						
Lee Kum Kee[tm]	Oyster Flavored Sauce, Panda Brand, Green Label, 5 LB	Water, Sugar, Salt, Oyster Extractives (Oyster, Water, Salt), Modified Corn Starch, Caramel Color.		P						
Roland®	Vegetarian Oyster Sauce 5Lb	Water, Sugar, Salt, Mushroom Powder, Modified Starch, Wheat Flour, Yeast Extract, Caramel Coloring, Xanthan Gum, Lactic Acid, Disodium Inosinate		X				P		
PLUM SAUCE										
Kikkoman®	Plum Sauce	Sugar, Water, Plum Puree, Vinegar, Ginger, Salt, Modified Corn Starch, Fermented Wheat Protein, Citric Acid, Xanthan Gum.		X						

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
PLUM SAUCE (continued)										
Koon Chun® Sauce Factory	Plum Sauce	Sugar, Rice Vinegar, Salted Plum (Plum, Salt), Sweet Potato, Ginger, Salted Garlic (Garlic, Salt), Water, Salted Chili (Chili, Water, Salt), & Salt.								
La Choy®	Sauce Plum Rtu 1/1Ga	Water, Sugar, Plum Puree, Tomato Puree (Water, Tomato Paste), Modified Corn Starch, Distilled Vinegar, Dehydrated Prunes, Pumpkin Puree, Sodium Benzoate (A Preservative), Lemon Powder, Natural Flavor, Spice.	P	P	P	P	P	P		
Lee Kum Kee™	Gold Label Plum Sauce	Sugar, Water, Plum, Salt, Distilled White Vinegar, Ginger, Modified Corn Starch, Garlic, Red Chili Pepper, Malic Acid, Xanthan Gum, Sodium Benzoate Added as A Preservative.								
Minor's®	Sauce Sweet & Spicy Plum RTU 4-.5Gal	High Fructose Corn Syrup, Corn Syrup, Water, Plum Juice Concentrate, Ginger Puree (Ginger, Water, Citric Acid), Salt, Modified Cornstarch, 2% Or Less of Spices, Corn Oil, Vinegar, Citric Acid, Caramel Color, Xanthan Gum, Natural And Artificial Flavors.	P	P	P	P	P	P		
READY TO COOK PORK										
Golden Tiger®	Pork Nuggets Tempura Batter	Pork, Water, Salt, Sodium Phosphate. Breaded With: Corn Starch, Bleached And Enriched Wheat Flour (Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid, Enzyme), Battered With: Water, Bleached And Enriched Wheat Flour (Niacin, Iron Thiamine Mononitrate, Riboflavin, Folic Acid), Rice Flour, Wheat Starch, Salt, Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate, Monocalcium Phosphate), Egg White Powder, Garlic Powder, Malted Barley Flour. Cooked in Vegetable Oil.		X			X			

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK PORK (continued)										
InnovAsian® Cuisine	Fully Cooked Crispy Tempura Pork	Pork, Water, Cornstarch, Bleached Enriched Flour, Dextrin, Dried Egg Whites, Dried Yolk, Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate, Monocalcium Phosphate), Modified Potato Starch, Skim Milk Powder, Rice Flour, Salt, Sodium Phosphate, Xanthan Gum. Cooked in Vegetable Oil.		X			X	X		
InnovAsian® Cuisine	Tempura Battered Pork	Pork, Water, Cornstarch, Bleached Enriched Flour (Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid). Contains Less Than 2% Of Dextrin, Egg Whites, Egg Yolks, Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate, Monocalcium Phosphate), Modified Potato Starch, Nonfat Dry Milk, Rice Flour, Salt, Sodium Phosphate, Xanthan Gum. Cooked in Vegetable Oil.		X			X	X		
Royal	Tempura Pork	Pork, Water, Bleached Enriched Flour (Wheat Flour, Niacin, Iron, Thiamine Mono-Nitrate, Riboflavin, Folic Acid), Cornstarch. Contains Less Than 2% Of Egg Whites, Garlic Powder, Leavening (Sodium Acid Pyrophosphate, Sodium Bicarbonate, Monocalcium Phosphate), Malted Barley Flour, Rice Flour, Salt, Sodium Phosphate, Wheat Starch. Fully Cooked in Vegetable Oil.		X			X			
READY TO COOK POTSTICKERS										
Amoy®	Potstickers, Pork	Filling: Pork, Cabbage, Green Onion, Sugar, Corn Starch, Salt, Soy Sauce (Water Soybean, Salt, Wheat Flour, Sugar, Caramel, Potassium Sorbate, Disodium Inosinate, Disodium Guanylate), Garlic, Sesame Seed Oil, Ginger, Yeast Extract, Black Pepper. Wrapper: Enriched Unbleached Flour (Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid, Water, Food Starch, Salt, Soybean Oil.	X	X						

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK POTSTICKERS (continued)										
Golden Tiger®	Potstickers, Gourmet Vegetable	Enriched Bleached Flour (Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, Cabbage, Celery, Carrots, Water Chestnut, Green Beans, Bamboo Shoots, Onion, Contains Less Than 2% Of: Rice Flour, Seasoning Blend (Dextrose, Dehydrated Soy Sauce [Soy Sauce {Wheat, Soybeans, Salt}, Maltodextrin, Salt], Modified Corn Starch, Garlic Powder, Spice, Natural Flavor Enhancer [Autolyzed Yeast Extract, Natural Flavor], Dried Shiitake Mushroom Powder, Disodium Inosinate, Disodium Guanylate, Soybean Oil), Vermicelli (Green Mung Beans, Water), Salt, Soybean Oil, Rice (Precooked Parboiled), Sugar, Natural Flavor (Contains Torula Yeast), Modified Corn Starch, Sesame Seed Oil, Shiitake Mushrooms (Water, Shiitake Mushrooms), Dried Portabella Mushroom Powder, Soy Sauce (Water, Soybeans, Salt, And Wheat Flour), Garlic, Spice.	X	X	P	P	P	P		
Golden Tiger®	Potstickers, Pork	Pork, Enriched Bleached Flour (Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, Cabbage, Soy Sauce (Water, Soybeans, Salt, And Wheat Flour), Contains Less Than 2% Of: Modified Corn Starch, Green Onion, Salt, Garlic, Rice Flour, Spices, Sugar, Sesame Seed Oil, Soybean Oil, Sodium Phosphate	X	X						

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
READY TO COOK POTSTICKERS (continued)										
InnovAsian® Cuisine	Potstickers, Wok Ready	Cabbage, Enriched Flour (Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Pork, Water, Pork Fat, Onion, Ground Chicken Meat, Canola Oil, Garlic Chives, Textured Soy Protein Concentrate, Garlic, Sake (Water, Rice, Koji [Aspergillus Oryzae], Salt), Seasoning (Salt, Yeast Extract, Maltodextrin), Sesame Oil, Sugar, Gelatin, Rice Flour, Chicken Broth Base (Chicken Broth, Autolyzed Yeast Extract, Chicken Fat, Modified Potato Starch, Sugar), Potato Starch, Soy Sauce (Water, Wheat, Soybeans, Salt, Alcohol [To Retain Freshness]), Spices, Soya Lecithin, Soy Flour, Sodium Caseinate, Disodium Inosinate And Guanylate, Dried Egg Whites (Sodium Lauryl Sulphate Added)	X	X			X			
Minh®	Potstickers, Pork	Enriched Flour And Enriched Durum Flour (Wheat Flour, Malted Barley Flour, Niacin, Reduced Iron, Ferrous Sulfate, Thiamine Mononitrate, Riboflavin, Folic Acid], Pork, Cabbage, Water, Green Onions, Soy Sauce (Water, Wheat, Soybeans, Salt, Lactic Acid, Sodium Benzoate [Preservative]), Contains 2% Or Less Of: Sugar, Vegetable Oil (Cottonseed, Canola, and/or Soybean Oil), Bleached Wheat Flour, Salt, Spice, Yellow Corn Flour, Garlic, Eggs, Wheat Gluten, Dried Onion, Sodium Tripolyphosphate, Leavening (Sodium Aluminum Phosphate, Baking Soda), Toasted Sesame Seed Oil, Nonfat Dry Milk. Fried in Vegetable Oil (Cottonseed and/or Canola Oil).	X	X			X	X	X	
SOY SAUCE										
Amoy®	Gold Label Soy Sauce	Water, Soybean, Salt, Wheat Flour, Caramel, Sugar, Preservative-Potassium Sorbate	X	X				P		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
SOY SAUCE (continued)										
Castella®	Soy Sauce	Water, Wheat, Soybeans, Salt, Sodium Benzoate, Less Than 1/10 Of 1% As A Preservative.	X	X	P					
Kikkoman®	Soy Sauce	Water, Wheat, Soybeans, Salt, Sodium Benzoate: Less Than 1/10 Of 1% As A Preservative	X	X						
La Choy®	Soy Sauce	Water, Salt, Hydrolyzed Soy Protein, Corn Syrup, Caramel Color, Potassium Sorbate (Preservative).	X	P						
Lee Kum Kee[tm]	Premium Soy Sauce	Water, Salt, Soybeans, Wheat Flour, Sodium Benzoate Added as a Preservative, Disodium 5; Inosinate & Disodium 5-Guanylate as Flavor Enhancers.	X	X						
STIR FRY SAUCE										
Foothill Farms®	Sauce Mix Asian Stir-Fried Rice 10-6.8	Dehydrated Vegetables (Pea, Carrot, Onion, Red Bell Pepper, Garlic), Salt, Maltodextrin, Hydrolyzed Corn & Soy Protein, Yeast Extract, Spice (Contains Ginger), Natural Flavor, Brown Sugar, Sugar, Soy Sauce (Wheat, Soybeans, Salt), Caramel Color, Corn Syrup Solids, Disodium Inosinate & Guanylate, Thiamine Hydrochloride, Spice Extractive, Canola Oil, Less Than 2% Silicon Dioxide (Anticaking).	X	X	P	P	P	P		
Kikkoman®	Stir-Fry Sauce	Naturally Brewed Soy Sauce (Water, Wheat, Soybeans, Salt), Sugar, Water, Modified Corn Starch, Wine, Vinegar, Garlic Powder, Oyster Extract (Molluscan Shellfish), Cultured Whey (Milk), Spices, Sodium Benzoate: Less Than 1/10 Of 1% As A Preservative, Succinic Acid, Disodium Inosinate, Disodium Guanylate.	X	X				X		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
STIR FRY SAUCE (continued)										
Lee Kum Kee[tm]	Stir-Fry Sauce Vegetarian (Bag in Box)	Water, Sugar, Soy Sauce (Water, Salt, Soybeans, Wheat Flour), Salt, Modified Corn Starch, Yeast Extract, Caramel Color, Natural and Artificial Mushroom Flavor (Natural Flavoring, Artificial Flavoring, Salt, Disodium 5'-Inosinate and Disodium 5' - Guanylate).	X	X	P	P	P	P		
Lee Kum Kee[tm]	Vegetarian Mushroom Flavored Stir-Fry Sauce	Water, Sugar, Salt, Soybeans, Modified Corn Starch, Brown Sugar, Wheat Flour, Contains Less Than 2% Of Caramel Color, Natural Flavor Shitake Type, And Sodium Benzoate Added as a Preservative.	X	X						
Minor's®	Sauce Stir Fry 4-64Flz	Water, Soy Sauce (Water, Wheat, Soybeans, Salt, Sodium Benzoate [Preservative], High Fructose Corn Syrup, Sherry Wine, Modified Cornstarch, Soybean Oil, Worcestershire Sauce (Distilled Vinegar, Molasses, Corn Syrup, Water, Salt, Caramel Color, Garlic Powder, Sugar, Spices, Anchovies, Tamarind, Natural Flavor), 2% Or Less Of Vinegar, Sesame Oil, Oyster Flavored Sauce (Oyster Extractives, Sugar, Water, Salt, Modified Corn Starch, Caramel Color), Dried Garlic, Salt, Onion Powder, Garlic Powder, Citric Acid, Spice, Caramel Color, Natural Flavors.	X	X	P	P	P	P	X	
SWEET & SOUR SAUCE										
Kikkoman®	Sweet & Sour Sauce	Water, Sugar, Soy Sauce (Water, Wheat, Soybeans, Salt), Vinegar, Modified Food Starch, Tomatoes Pineapple Concentrate, Onion Powder, Carmine (Color), Green Bell Pepper Flakes, Citric Acid, Garlic Powder, Disodium Inosinate, Disodium Guanylate, Red Pepper, Sodium Benzoate; Less Than 1/10 Of 1%	X	X						

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
SWEET & SOUR SAUCE (continued)										
Lee Kum Kee[tm]	Sweet & Sour Sauce	Water, High Fructose Corn Syrup, Distilled White Vinegar, Sugar, Tomato Paste, Modified Corn Starch, Pineapple Juice Concentrate, Salt, FD&C Yellow 5, FD&C Red 40, Citric Acid, FD&C Yellow 6, Xanthan Gum, Natural Flavor, Sodium Benzoate Added as A Preservative.	P		P	P	P	P		
Minor's®	Sweet & Sour RTU Sauce	Water, High Fructose Corn Syrup, Pineapple Tidbits (Pineapple, Pineapple Juice, Citric Acid), Diced Tomatoes (Tomatoes, Tomato Juice, Citric Acid, Calcium Chloride), Vinegar, Modified Cornstarch, Hydrolyzed Soy Protein, 2% Or Less Of Brown Sugar Syrup, Soybean Oil, Tomato Paste, Salt, Corn Syrup Solids, Dehydrated Onion, Dehydrated Green Peppers, Spices, Lemon Juice Concentrate, Onion Powder, Garlic Powder, Beet Powder (Color).	X							
Roland®	Sweet and Sour Duck Sauce	Water, High Fructose Corn Syrup, Vinegar, Modified Corn Starch, Apricots (Contains Sulfites), Salt, Citric Acid, Sodium Benzoate (As A Preservative), Potassium Sorbate (As A Preservative), Spices, Xanthan Gum.								
Sun Luck®	Sweet & Sour Sauce, Restaurant Style	High Fructose Corn Syrup, Sugar, Water, White Vinegar, Tomato Paste, Modified Corn Starch, Soy Sauce (Water, Soybeans, Wheat, Salt), Sodium Benzoate (Added as A Preservative), Spices, Salt, FD&C Red 40, FD&C Yellow 5.	X	X						
TERIYAKI SAUCE										
Iron Chef[tm]	Teriyaki Baste & Glaze	Soy Sauce (Water, Soybeans, Wheat, Salt, Sugar, Water, Hydrolyzed Vegetable Protein, Food Starch, Vinegar, Ginger Puree, Dry Onion, Spices, Dry Garlic, Natural Flavors, Citric Acid. No MSG.	X	X	P	P	P	P		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
TERIYAKI SAUCE (continued)										
Kikkoman®	Teriyaki Marinade & Sauce	Naturally Brewed Soy Sauce (Water, Wheat, Soybeans, Salt), Wine, High Fructose Corn Syrup, Water, Vinegar, Salt, Spices, Onion Powder, Succinic Acid, Garlic Powder, Sodium Benzoate: Less Than 1/10 Of 1% As A Preservative.	X	X						
La Choy®	Teriyaki Sauce	Soy Sauce (Water, Salt, Hydrolyzed Soy Protein, Corn Syrup, Caramel Color, Potassium Sorbate [Preservative]), Sugar, Sherry Wine, Corn Syrup Solids, Pineapple Juice Concentrate, Distilled Vinegar, Less Than 2% Of: Modified Corn Starch, Burgundy Wine, Pineapple Juice Powder, Salt, Garlic Powder, Caramel Color, Potassium Sorbate (Preservative), Water, Natural Flavor.	X	P	P	P	P	P		
Lee Kum Kee[tm]	Teriyaki Glaze	Sugar, Soy Sauce (Water, Wheat, Soybeans, Salt), Rice Cooking Wine (Rice, Water, Salt), Water, Modified Corn Starch, Pineapple Juice Concentrate, Contains Less Than 2% Of Salt, Ginger Puree, Yeast Extract, Citric Acid, Phosphoric Acid, Xanthan Gum, And Sodium Benzoate Added as A Preservative.	X	X						
Minor's®	Teriyaki Sauce	Water, Soy Sauce (Water, Wheat, Soybeans, Salt, Sodium Benzoate [Preservative]), High Fructose Corn Syrup, Sherry Wine (Sherry Wine, Salt), Brown Sugar Syrup, Modified Cornstarch, 2% Or Less of Soybean Oil, Sesame Oil, Dried Onions, Citric Acid, Natural Flavors.	X	X	P	P	P	P		

APPENDIX M. CONTINUED

Brand	Item Name	Ingredient List	Major Allergen (X = Contains; P = Potentially Contains)							
			Soy	Wheat	Peanut	Tree nuts	Egg	Milk	Fish	Shellfish
PREMADE WRAPPERS										
Golden Tiger®	Wonton Wrapper 6.5X6.5	Enriched Wheat Flour (Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, Salt, Whole Egg Powder, Sodium Propionate, Citric Acid, Sodium Benzoate Added to Retard Spoilage, Dough Conditioner (L-Cysteine), Dusted with Cornstarch.		X			X			
Hanson Foods	Wonton Wrappers	Wheat Flour, Water, Eggs, Salt, Cornstarch, Soy Lecithin, FD&C Yellow No. 5 & No. 6, Less Than 0.1 Of 1% Sodium Benzoate as A Preservative.	X	X			X			
Rose Brand	Thin Wonton Wrappers	Enriched Flour (Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin and Folic Acid), Water, Eggs, Salt, Cornstarch and Sodium Bicarbonate.		X			X			
Twin Dragon®	Thick Wonton Wrapper	Enriched Wheat Flour (Wheat Flour, Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, Salt, Potato Starch, Citric Acid, Dusted with Cornstarch.		X						
Wing Hing®	Won Ton Wraps Bulk	Enriched Wheat Flour (Niacin, Reduced Iron, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, And Eggs. Contains 2 Percent or Less of Salt, Sodium Benzoate (A Preservative), Enzyme, And Dusted With Cornstarch		X			X			