



Investigation on the understanding and implementation of food allergen management among Thai food manufacturers



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ABSTRACT

The understanding and implementation of food allergen management among HACCP-certified Thai food companies were surveyed during 2008–2009 by questionnaires and direct interviews with quality control managers of the companies. Forty of 72 respondents answered that they implemented a food allergen control program as part of existing product quality control and safety management. The awareness and understanding of food allergen management depended on the company's dominance in the market place as well as experience in food quality control and safety management. Although Thailand has no food allergen labeling legislation, the respondents expected that food allergen labeling legislation will soon be adopted in Thailand. Earlier implementation of labeling regulations has been driven by adherence to WTO (Codex) rules. The results of this survey indicated the substantial effectiveness of the present allergen control programs of Thai food manufacturers, and also their potential capability of food allergen management for domestic products at a level equal to that for export products.

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1. Introduction

Food allergy is defined as an adverse immune response of a sensitive person to food proteins (Sicherer & Sampson, 2006). Currently, food allergy is a significant and growing public health concern worldwide, affecting nearly 1% of the world's adult population (Ajala et al., 2010). The symptoms vary from mild to severe, and can occasionally be deadly serious (Reading, 2009). Because there is no medical cure for food allergy, the only way of preventing allergic reactions is strict avoidance of the hazardous allergic food (Vierk, Koehler, Fein, & Street, 2007). Any food has the potential to be allergenic, and in fact a large number have been reported to provoke allergic reactions. Among those, eight foods – peanuts, nuts, wheat, soy, eggs, milk, fish and shellfish – are widely used in food manufacturing, either as raw materials/ingredients or as food eaten by itself. These foods are reportedly responsible for causing more than 90% of allergic reactions in the USA (Bush & Hefle, 1996). Thus, a food that is nutritious for the majority of people might

represent an extreme hazard to someone with food allergy. In order to protect such allergic individuals, a food allergen labeling system, providing information on specific food allergen ingredients on the product label, has been adopted globally (Mills et al., 2004; Yamakawa et al., 2007).

Fundamentally, the enforcement of the practical food control regulation is essential to achieve successful food safety as it ensures the effective reaction and failure exclusion by the legal guarantee (Tähkääpää, Nevas, Kallioniemi, Korkeala, & Majjala, 2013). However, the control of food allergens is still not achieved even in countries which have enforced regulations related food allergy. The successful implementation to control the food allergen involves various factors, i.e. knowledge, attitude, practices and specific training received among the relevance persons (Choi & Rajagopal, 2013). Also, the efforts to reduce food hazard in places must consider active managerial control of risk factors in manufacturing (Wang et al., 2012). The risk factors are introduced as food products are improperly labeled, or contain a food allergen due to mismanagement e.g. overlooking the presence of an allergic ingredient (De Luis, Lavilla, Sánchez, Calvo, & Pérez, 2008); unintentional inclusion of a food allergen by cross-contamination during the food production process due to insufficient cleaning of

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shared equipment (Holzhauser & Vieths, 1999); and contamination through common facilities of production, such as a warehouse storing various raw materials for manufacturing (Hefle & Taylor, 2004). These undeclared food allergens in products pose a potential risk for allergic individuals. In fact, hospital emergency departments have reported severe allergic reactions caused by the accidental intake of food containing allergic materials (Wüthrich & Ballmer-Weber, 2001). Generally, the complete removal of allergenic ingredients from food products is not realistic (Crevel, 2005). Nevertheless, it is the responsibility of food manufacturers to continue their efforts to provide safe food for the consumer by establishing effective food allergen management practices: providing accurate allergen information on the product label, and preventing inadvertent cross-contamination of food allergens at all processing stages (Huggett & Hischenhuber, 1998).

In Thailand, food allergy is an unfamiliar concern; the majority of people are not aware of the problem, even though a significant number of studies have reported that food allergy exists in Thailand, similar to the situation in other countries (Poachanukoon & Paopairochanakorn, 2006; Santadusit, Atthapaisalsarudee, & Vichyanond, 2005). This indicates that food allergy is a latent public health hazard in Thailand.

Recently, we reported on the presence of undeclared food allergens in commercial Thai food products for local consumption. The results highlighted the potential health risks to Thai food-allergic individuals, and demonstrated the need for careful management of food production and labeling of food allergen information by Thai food manufacturers (Surojanametakul et al., 2012). Presently, food allergy-related information among Thai food manufacturers is lacking. Thus, a survey to assess the state of Thai food manufacturing is urgently required in order to ensure the potential capability of Thai food manufacturers to adjust to international food allergen management standards, as well as to ensure the safety of commercial food products. The present work is the first survey to focus on the understanding and implementation of food allergen management among Thai food manufacturers.

2. Methods

2.1. Selection of objective companies

The information presented in this report was collected via a field survey through questionnaires and direct interviews with food manufacturers during the years 2008–2009. Names and product categories of registered Thai food manufacturers certified as conforming to the Hazard Analysis and Critical Control Points (HACCP) management system were collected from a Thai company almanac and from the websites of all relevant Thai organizations, i.e. National Food Institute, Food and Drug Administration, and National Bureau of Agricultural Commodity and Food Standards of Thailand. A total of 121 food manufacturers, representing 14 primary food categories, were selected for the investigation.

2.2. Data collection

The questionnaire was composed of four parts: (1) general manufacturer profile; (2) production line characteristics; (3) food allergen control implementation; and (4) knowledge, understanding and concern regarding food allergen management. Questionnaires as well as further interviews were directed to the most knowledgeable person(s) responsible for quality control (QC), e.g. the QC manager, in order to assess the level of awareness, understanding and practices addressing food allergen management on-site.

2.3. Data analysis

Percentage responses are calculated based on the number of respondents answering the question. Depending on the questions, results are presented using descriptive statistics together with correlation analysis among parameters of company profiles, production line characteristics, understanding of food allergens, food allergen control procedures, and food allergen concerns.

3. Results

3.1. Food manufacturers profile information

From the total of 121 HACCP-certified food manufacturers, consisting of small-, medium- and large-size companies, 72 (59.5%) returned completed questionnaires. However, the responses were disproportionate: the majority of questionnaires were from large-size companies (51), followed by medium (17) and small (4) companies (Table 1). The 72 responding companies had varying experience with HACCP practices: up to 5 years (58.3%), 6–10 years (37.5%), and >10 years (4.2%). Although the HACCP system was first introduced in 1995, the Thai government has only recently begun to strongly promote HACCP in order to raise the level of Thai food manufacturing up to international standards.

Table 2 presents the number and percentage of food manufacturing companies by product category and company size. The 72 surveyed companies comprised 14 food categories, and some companies manufacture multiple food product categories; thus the sum of food manufacturers associated with all categories was larger ($n = 98$) than the total number of companies ($n = 72$).

Among 14 food categories, 5 categories – baby formula, snacks, frozen and ready-to-eat meals, meat, and hydrogenated and refined oils – were represented almost entirely by large-size companies (Table 2). This is probably due to the difficulty of small- and medium-size companies in competing with global enterprises in terms of efficient and economical production while maintaining quality. On the other hand, bakery products were produced only by medium-size companies; these products are not popularly consumed as a staple food among Thai people, and are products that are less technology-oriented, requiring freshness instead. Four food categories – beverages and soy milk, milk and dairy products, sauces and condiments, and premixed flour – were manufactured by companies of all sizes.

Among the products manufactured by the 72 companies, frozen and ready-to-eat meals were the most frequently found (14), followed by beverages and soy milk (13) and fishery products (12). These convenience food products currently are gaining in popularity among consumers because of the changing Thai lifestyle, and additionally are exported extensively with the encouragement of the government's "Thai Kitchen to the World" policy.

Cereal, frozen and ready-to-eat meals, fishery products, and beverages and soy milk, which are among Thailand's leading export products, occupied the majority of HACCP-certified companies due

Table 1
Number^a and percentage of HACCP-certified companies, by size.

Company size	Company	
	Number	Percentage (%)
Category 1 (small <10 employees)	4	5.6
Category 2 (medium 10–100 employees)	17	23.6
Category 3 (large >100 employees)	51	70.8
Total	72	100

^a Number of companies that answered the questionnaire.

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