Allergens-
practical control measures in the food industry

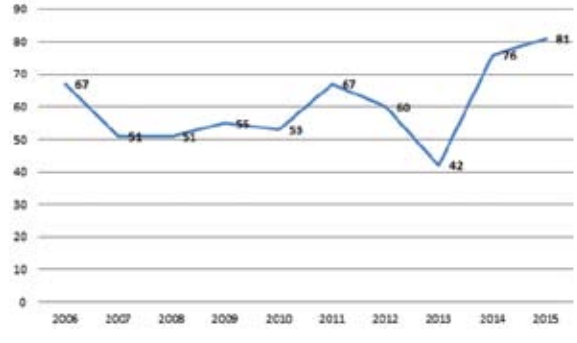
The presence of allergens is the most common reason for triggering a product recall in Australia and data shows a disturbing trend. This trend is occurring at the same time as an increase in the number of allergen-susceptible individual. A study released in 2013 by the Centres for Disease Control and Prevention, showed that food allergies among children increased approximately 50% between 1997 and 2011. These two trends, an increase in allergen recalls and an increase in susceptible individuals pose a concerning scenario for regulators and the food industry.

Recently released figures by the Australian Bureau of Statistics reveal that almost 4 million people in Australia reported avoiding a food type because of allergy or intolerance. Of those, about 560,000 were children aged between two and 18 years. In this group, girls were more likely than boys to be susceptible. The Australasian Society of Clinical Immunology and Allergy (ASCIA) reports that food allergy occurs in around 1 in 20 children and in about 2 in 100 adults.

Figures compiled by Food Standards Australia New Zealand (FSANZ) over the last 10 years indicate an average of 60 food safety recalls per year. Of these, approximately one third on average are due to the presence of undeclared allergens.

The graph below shows the trend in product recalls over the last 10 years.

Number of recalls per year (2006-2015)



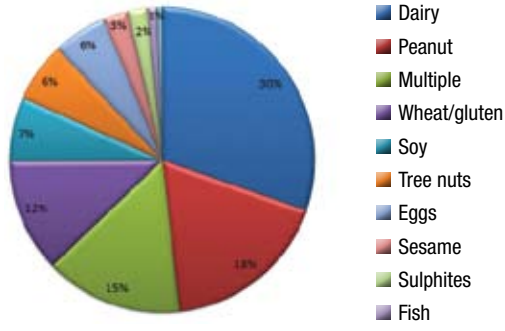
A closer look at the data shows a significant increase in recalls over the last three years to a position exceeding the average by some 30%. Possibly more alarming is the role of allergens in this increase as shown below;

	10 Year Average	2013	2014	2015
Total No Recalls	60	42	76	81
Allergen Recalls	19	16	27	39
% Allergen Recalls	31%	38%	35%	48%

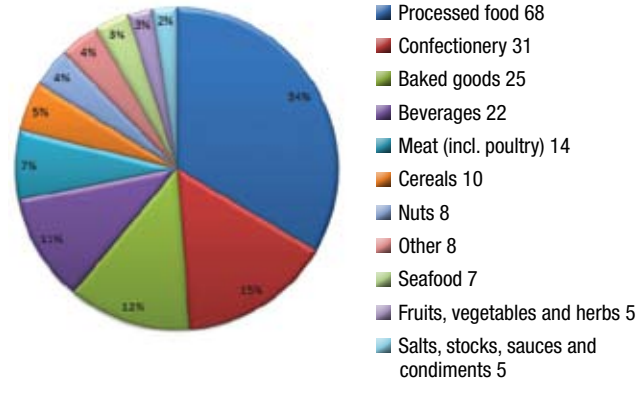
In 2015, allergens accounted for nearly half of all product recalls at a frequency of over three per month on average.

Over 10 years, the most common allergens responsible for a product recall were dairy (30%), peanuts (18%), multiple allergens (15%) and wheat/gluten (12%). Approximately three quarters of all allergen recalls are caused by allergens represented by these four groups. The graph below shows the breakdown of allergens.

Undeclared allergen recalls



Not surprisingly, the majority of allergen based recalls come from complex foods including processed foods (34%), confectionery (15%), baked goods (12%) and beverages (11%). Again, these four groups account for nearly three quarters of all recalls. This indicates a clear relationship between the complexity of the food and process and the likelihood of a product recall due to the presence of undeclared allergens.



A similar picture has emerged in Europe where, according to the European Academy of Allergy and Clinical Immunology (EAACI), about 17 million Europeans have a food allergy. The figures here are perhaps surprising considering the legislative pressure that has been applied to food processors by the European Union, requiring, back in 2005, the mandatory labelling of 12 specified food allergens.

That list has now extended to 14, as specified in the Food Information for Consumers (FIC) Regulations and more are potentially on the horizon.

The issue is also tackled by the GFSI benchmarked Global Food Safety Standards including the British Retail Consortium's (BRC) Global Standard for Food Safety, adopted by approximately 20,000 food processors worldwide, with other standards such as IFS and FSSC 22000 not that far behind.

Within these standards there are stringent, mandatory clauses requiring a processor to perform risk assessment, taking into account the nature and source of allergen and adopt appropriate allergen controls, normally, through a pre-requisite control-based allergen management process.

The aim is to reduce the number of allergen related incidents that require withdrawal or recall from the market.

Practical allergen controls

A HACCP based allergen risk assessment programme is key to allergen management and control. As an example of this approach, the BRC Global Standard for Food Safety requires a risk assessment to establish the presence and likelihood of contamination by allergens plus the implementation of controls taking into account the nature of those allergens (dusts, liquids, solids).

Systems must be implemented to ensure integrity and compliance with specification throughout the supply chain. The following areas, managed as HACCP pre-requisite procedures, can all help to reduce the potential for allergen misinformation or contamination:

- Supplier and ingredient control requires the review and management of supplier ingredient specifications to identify those which intentionally contain allergens and those which may, unintentionally, be contaminated. One of the potential pitfalls here is reformulation of the ingredient by the supplier without the provision of amended and updated specifications. Knowledge of the supplier's allergen management procedures is a factor and can be facilitated by something as simple as an allergen management questionnaire to determine allergen control procedures on the supplier's site and therefore the overall risk of allergen cross contamination by the supplier. This can be followed, as necessary, or where information is scarce, by a formal on-site allergen audit.

- Controlled on-site food storage by the processor requires segregation or other validated control to ensure contamination of non-allergenic foodstuffs or ingredients by allergens is eliminated or reduced to a safe level. For very high risk, low threshold allergens such as nuts this might require entirely separate storage areas. For foodstuffs more likely to be the cause of intolerance, rather than severe anaphylactic shock, such as gluten-containing foods, it may be sufficient to use separate shelves or racks within common storage areas.

- Segregated handling or processing of foods, during production, may require entirely separate processing halls or even factories, especially in the case of high risk allergens such as nuts. Otherwise, and where risk assessment allows, the processor can employ time separation, so that allergen containing foods are made at the end of the production day and this activity can be followed by a deep "allergen clean down" which might not be possible during shorter, between-batch production breaks. Test kits and methods are quite widely available to measure residual allergen traces following clean down and to help with validation of this control. It is worth remembering that these test kits themselves, when used in-house require validation. Alternatively allergen residual swabs can be tested by an accredited laboratory, having first checked that the scope of accreditation covers such testing.

> "Nearly one half of recalls are due to undeclared allergens."

- Staff awareness and staff movement control is a key area to consider. Higher risk allergens such as nuts may have to be handled, not only in separate areas, but by separate, visibly identifiable staff, wearing specific, often colour-coded protective clothing. Staff training should always now encompass an element of allergen awareness and competence with regard to allergen management procedures. This training must be provided before food handling duties commence. Staff should be made aware of the types of food allergens that exist and that are legislated for. They should be made aware of potential sources of allergen cross contamination and misinformation such as use of the wrong labels or packaging.

- Control of labels and packaging, especially during product change-over, can prevent a foodstuff entering the market with incorrect or absent allergen warnings. This is a supervisory issue requiring a check that labels and packaging have been correctly changed over when a new product is being packed. The information that must be placed on labels and packaging, with regard to allergens, is a technical management and new product development issue. Common pitfalls are the use of a new or reformulated ingredient, new allergens being handled on site, new equipment being used, new layouts implemented, new production schedules drawn up or new cleaning regimes being put in place. Just as in Principle 6 of Codex HACCP, a review of the allergen risk assessment is crucial to ensure that changes to the allergen status of a product is identified and reflected on the label and packaging.

- Allergen audits can be implemented as part of the internal auditing process. The audit should ideally pick a final, packaged product and trace back through all storage, formulation, processing and packaging steps to the ingredients used, ingredient specifications held and the information supplied by the supplier in regard of their allergen controls. In this way the risk of allergen

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contamination and inclusion of intentional allergens can be validated against the allergen declaration and "may contain" information provided on the label or packaging of the chosen product.

- Supplier understanding. Suppliers of ingredients, in particular those which are imported, may not have a clear understanding of allergen requirements in the Australian market. A recent example involved a grade of sugar that contained high levels of sulphur dioxide which was substituted into a blended product resulting in a recall of the finished product. In this case, it appears likely that the supplier was not aware of the intended use of the product or the significance of this allergen under the Australian Food Regulations. Therefore, when considering the use of imported ingredients, it is strongly recommended that the supplier is made aware of the allergen issue and should be encouraged to conduct an allergen review within their operation. Routine verification of imported ingredients and products conducted by the importer is also appropriate and can avoid costly surprises when a product ends up in the marketplace.

- Equipment selection and use, together with materials of construction and design of surfaces such as floors and walls is often overlooked, even when all other allergen management controls are in place. Yet this control is just as important as the others. For instance, as a rough guide, the higher the IP rating on equipment the less likely it will be for particles of food, some of which may be allergenic of course, to become trapped. In more general terms equipment and materials selection must be influenced by cleanability and accessibility. Ask yourself the following question – Can I access all surfaces easily and are they designed to facilitate a deep "allergen clean down" to prevent them becoming a source of allergen cross contamination.

- The same principle extends to cleaning equipment. In general, those surfaces and pieces of equipment which can be cleaned and then disinfected to reduce to safe levels bacteria such as Listeria monocytogenes should be at minimal risk of being a source of allergen contamination. ❇

All statistics and graphs; Food Standards Australia New Zealand web page; 'Food recall statistics', http://www.foodstandards.gov.au/industry/foodrecalls/recallstats/Pages/default.aspx , referenced 15 July 2016.

Martin Stone,
Technical Director,
HACCP Australia