# Food allergens and their management in the food industry

***by Karen Middleton-Gell, Technical Director, The Society of Food Hygiene and Technology, UK.***

Food allergy and intolerance is of concern to the whole food industry and it is the responsibility of all food businesses to minimise the risk of the potential harmful effects on consumers through effective management of food allergens.

Although there is evidence that food allergies are becoming more common, the number of foods to which people react is extensive. However, the majority of reactions are associated with a relatively small number of foods. The proportion of the population with a true food allergy is estimated to be 1-2% of adults and about 5-8% of children, which equates to about 1.5 million people in the UK.

Severe allergic reactions are relatively rare and they are most commonly caused by only a handful of foods. Labelling rules in European Directives 2003/89/EC and 2006/142/EC ensure that all consumers are given comprehensive ingredient listing information to make it easier for people with food allergies to identify ingredients they need to avoid.

Fourteen food allergens with reference to the source allergen whenever they, or ingredients made from them, are used at any level in prepacked foods, including alcoholic drinks.

The list consists of cereals containing gluten, crustaceans, molluscs, eggs, fish, peanuts, nuts, soybeans, milk, celery, mustard, sesame, lupin and sulphur dioxide at levels above 10mg/kg, or 10mg/litre, expressed as SO2.

Allergen management is important for food businesses both in terms of complying with the ingredient labelling requirements and also in deciding whether or not to use advisory labelling.

This management involves evaluation of the likelihood of allergen cross-contamination associated with every step of the food production process, from sourcing raw materials through to marketing of a finished product.

Existing GMP controls in a food business will assist with allergen management, for example avoiding cross-contamination by segregation, cleaning, using separate utensils etc.

However, unlike microbiological risks, heating does not necessarily destroy food allergens and may actually increase their potency, for example roasting peanuts. The introduction of allergen management into a food business can be seen as an extension of existing food safety management rather than a completely new system.

The key aspects of food and drink manufacturing businesses to be considered in the management of allergens are:

- **Raw materials supply chain:**

Food businesses should assess the allergen status of all raw materials. Any change in supplier should be accompanied by the appropriate checks. Manufacturers need to be aware of the presence of the major allergens in all raw materials, particularly the potential for allergen cross-contamination from manufacturing and handling activities on the raw material suppliers' sites, as well as earlier in the food chain during harvesting and transport.

This may be through audits or from asking suppliers to provide the required information. Manufacturers should ensure that materials are ordered against a clear specification and that they ask appropriate questions of their suppliers.

Allergenic raw materials should be stored in clearly identified areas where possible, for example, using colour coded boxes or demarcation of storage areas using painted lines on the floor.

Where allergenic raw materials are de-bagged or de-boxed, they should if possible, be placed in dedicated lidded and labelled containers and made easily identifiable. Such containers should only be used for storage of other raw materials after appropriate cleaning. If allergenic ingredients are sieved, then the sieving unit should be dedicated or thoroughly cleaned after sieving allergenic ingredients.

If possible, allergenic ingredients should be sieved after all other raw ingredients have been sieved for the day

- **Manufacturing premises, equipment and processes:**

The best approach to avoiding cross-contamination with allergens is to dedicate production facilities to specific allergenic products, however it is recognised that this is not always an option particularly in small businesses. Where dedicated production facilities are not possible, there are a number of ways of separating the production of allergen containing products from those that do not contain the allergen. These can include separating production to a different area; using physical barriers between production lines; dedicated equipment; minimising unnecessary movement and appropriate cleaning between production runs.

- **Shared equipment:**

Where possible, consideration should be given to the dedication of equipment within production facilities. For example, weighing equipment, scoops and utensils could be dedicated and the weighed product placed in dedicated, lidded and labelled containers. Consideration could be given to colour coding equipment, although this may not be practical where a number of allergens are being handled, and/or colour coding is used already for other purposes, such as the identification of cooked or raw ingredients, or vegetarian products.

- **Physical separation:**

Physical separation should be considered for 'high risk' ingredients and the implications of changes to the layout of the food production area should be assessed. Consideration should also be given to the ease of cleaning of equipment. Avoiding the crossover of production lines and allowing adequate space for effective cleaning will help minimise the risk of allergen cross-contamination.

- **Airborne particles in the manufacturing area:**

The implications of air movement also need to be considered. For example, where nut products and nut free products are produced in the same production area it may be possible to dedicate air conditioning/extraction fan systems to contain nut dust, or positive pressure may be used in nut free rooms to prevent nut traces entering the room in the air.

When planning production runs schedule those products not containing the allergenic ingredient first. Additionally, long runs of allergenic products should be undertaken

*Continued on page 14*

*Continued from page 13*
wherever possible, to minimise changeovers and these should be followed by a major clean down.

**Storage:**
Consideration should be given to the temporary labelling of work in progress, such as a half-finished product that is held over. Care should be taken to ensure that the product is not mistaken for another product with a different set of allergens.

Similarly, care should be taken to label and store packaging materials that are unused at the end of a production run. Co-products, such as misshapes and broken products, which for quality reasons are not acceptable as finished product but could still be consumed by employees or sold through factory shops, should also be subject to the normal allergen labelling controls.

**Re-work:**
Re-work that contains allergenic ingredients should be re-worked only into products that contain that allergen. Re-work should be clearly identified in order that it may be tracked in the manufacturing process.

**Cleaning:**
Very small amounts of some allergens, such as nuts, can cause adverse reactions, including potentially fatal anaphylactic shock. Therefore, thorough cleaning that is effective in reducing the risks of allergen cross-contamination should be used where appropriate.

A 'visually and physically clean' standard is not just a casual visual inspection of the production line or area, it also requires that all of the trouble spots are sought out and inspected.

Cleaning practices that are satisfactory for hygiene purposes may not be adequate for removing some allergens and their validity for such a purpose should be assessed, for example, via allergen residue/environmental swab testing.

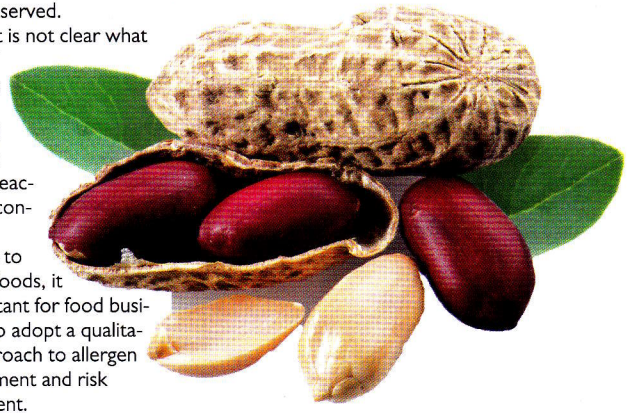
**Packaging:**
Incorrect packaging and/or labelling is a major cause of allergen related product recalls. Procedures for checking that the correct labels are applied to products should be implemented and audited regularly, so that accurate information is provided to allergic consumers.

**New product development and reformulation:**
The introduction of a new product or any changes to existing products or production process within the food production area can affect the risks of allergen cross contamination of other products. Following any such changes, it will be necessary to conduct a new assessment of the risks of allergen cross-contamination of a product, including an evaluation of any advisory labelling that might be necessary.

**People:**
All staff (including temporary staff and contractors) involved in handling ingredients, equipment, utensils, packaging and products should be aware of food allergens and the consequences of their ingestion by sensitive individuals.

They should be trained in avoiding cross-contamination of foods by the major food allergens. Appropriate procedures on the management of allergens should also be available and/or posted wherever they need to be observed.

Since it is not clear what levels of allergens are required to cause allergic reactions in consumers sensitive to various foods, it is important for food businesses to adopt a qualitative approach to allergen management and risk assessment.



Consumers with a food allergy need to read and understand food labels in order to buy food that is safe for them.

It is therefore of paramount importance and the responsibility of food businesses to provide the consumer with clear accurate information, both in terms of complying with the ingredient labelling requirements and also in deciding whether or not to use advisory labelling.

This management involves evaluation of the likelihood of allergen cross-contamination associated with every step of the food production process, from sourcing raw materials through to marketing of a finished product. ■