Allergens

Assessing risk and mapping your facility

Evaluate and mitigate your allergen risks

Allergen mapping is a part of allergen risk assessment and is an effective tool to identify and track allergens in your facility. An allergen map will provide a visual guide on the location of allergens and the areas and process steps most at risk from allergen cross contamination. This guide provides a suggested approach as well as worksheets that can support you through the processes involved. The process of allergen mapping and risk assessment is also an opportunity to challenge current processes and practices to identify improvements that may provide greater assurance that allergens are effectively controlled in your facility.

Like Hazard Analysis and Critical Control Point (HACCP) food safety risk assessments, the most effective allergen risk assessments are generally completed by a multidisciplinary team made up of knowledgeable technical/quality, production, procurement, innovation (NPD) and maintenance staff. Once the team is assembled, the allergen risk assessment can be applied in a step-by-step methodology. The following process is a suggested method however due to a lack of prescriptive industry methodology, you may modify and adapt to best suit your allergen risk.

Step 1: Gather the required information

☐ **List all raw materials and the allergen status of each ingredient, processing aid, work-in-process and rework product.**

- The list of raw materials should be cross referenced with the most current product specifications and/or product information forms (PIF) to confirm all declared allergens have been captured.
- This list should also be verified against actual products stored in the warehouse and the NPD store to confirm "what we think we have, is actually what we have".
- The form of the allergen is also important as powdered allergens (flour, milk powder, soy isolate, etc) have a greater risk of becoming airborne and spreading to other areas of the facility than particulate allergens (e.g. sesame, tree nuts) which are spread through people movement and cleaning practices.

Raw material allergen matrix

☐ **List the ingredients and suppliers** you use in the chart below under the appropriate headings and highlight any that fall into the categories across the top of row of the chart. A completed chart is included as an example in Appendix 1 on page 5 of this guide for reference.

Ingredient	Supplier	Peanut	Tree nut	Egg	Milk	Gluten	Soy	Sesame	Fish	Crustacea	SO2 >10mg/kg

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Step 1: Gather the required information continued...

Finished product allergen matrix

☐ A list of allergens present in finished products is also required to understand the production scheduling and sequencing processes.

List the finished products you use under the appropriate headings and highlight any that fall into the categories across the top of row of the chart. A completed chart is included as an example in Appendix 2 on page 5 of this guide for reference.

Ingredient	Supplier	Peanut	Tree nut	Egg	Milk	Gluten	Soy	Sesame	Fish	Crustacea	SO2 >10mg/kg

☐ **Obtain the most current process flow diagram** for each unique production process to use as guide to query the potential for allergen cross contamination from equipment and the environment.

☐ **Obtain a current copy of the factory floor plan** indicating all areas and access points from receival and storage of raw materials, (including external warehouses), ingredient weigh-up, processing, packing and finished product warehousing and dispatch.

Step 2: Conduct the Allergen Risk Assessment

Physically walk through the facility in the sequence of steps shown on the process flow diagram looking for the presence of allergens and the possibility of allergen cross-contact at each process step. Look for sources of environmental allergen contamination in each area such as:

Receival and storage of raw materials

☐ Is there effective segregation between non-allergens and allergens?

☐ Is there effective segregation between different allergens?

☐ Is there signage or an electronic warehouse management system facilitating designated storage areas for allergens?

☐ Are allergens stored above non-allergens increasing the risk of accidental contamination though an allergen spill from a broken bag?

☐ Is the storage of NDP ingredients known and this area effectively segregated from bulk ingredient storage?

☐ Are part used bags of allergens returned to the raw material warehouse effectively closed or sealed between uses?

☐ Are there procedures in place to contain and remove an allergen spill with designated cleaning equipment provided?

Ingredient weigh up

☐ Are separate/designated utensils used for weigh up of allergens vs. non allergens?

☐ Are facilities provided to periodically wash utensils?

☐ Is there excessive dust build up when weighing ingredients which may create the potential for environmental contamination from allergens carried through the air to non allergen contact surfaces?

☐ Is suitable mechanical dust extraction provided for powdered ingredient weigh up?

Step 2: Conduct the Allergen Risk Assessment continued...

Transfer to production processing area

- [ ] Are all ingredients, WIP and rework covered during transit to processing areas?
- [ ] Is product identification suitable to indicate allergens to production staff?
- [ ] Is WIP and rework clearly labelled to indicate allergen status?

Production processes

- [ ] Is production scheduling for allergen sequencing between products strictly applied?
- [ ] Is there shared equipment that may have production hang up between batches?
- [ ] Are validated cleaning processes used between allergens and non allergens?
- [ ] Is there potential for protective clothing to be a source of allergen contamination through people movement and practices?
- [ ] For allergens that form fine powders when used, (e.g. flour), is the movement of airborne dust minimized by using physical barriers or segregated areas for mixing operations?
- [ ] Where are air-conditioning outlets located and does the use of ceiling or floor fans distribute airborne allergens?
- [ ] Are waste-handling protocols effective to ensure waste removal processes do not spread allergens from one area to another?

Packing

- [ ] Are product change over protocols for labelling strictly applied to ensure 'right product in right label'?

Finished product storage & dispatch

- [ ] Is finished product stored fully enclosed in packaging to prevent allergen contamination during storage and transport processes?

Allergen risk assessment flow diagram

- [ ] **List each stage of your production process** in the first column and assess if any fall into the categories across the top row of the chart. A completed chart is included as an example in Appendix 3 on page 6 of this guide for reference.

Process step	Peanut	Tree nut	Egg	Milk	Gluten	Soy	Sesame	Fish	Crustacea	SO2 >10mg/kg

- [ ] **Complete the allergen map**

A completed map is included as an example in Appendix 4 on page 7 of this guide for reference.

- On the floor plan(s) for each location obtained in Step 1, mark where allergens are stored and handled; indicate which allergen is present if your facility handles multiple allergens. Confirm any variables that may change your point in time observations such as peak production, special one-off production orders, seasonal variations in products etc. NOTE: Any contamination risk identified during the facility walk-through needs to be identified in the allergen risk assessment to enable a suitable control measure to be identified.

Step 3: Apply the information from the allergen risk assessment and mapping process

- ☐ When all known locations of allergen handling and storage are identified, the allergen risk assessment team need to consider the **probable risk against remote opportunity** for allergen contamination or cross-contact.
- ☐ Any probable risks need a **practicable and sustainable control measure** to be identified to eliminate, reduce or prevent the allergen contamination risk.
- ☐ The rigour of **control measure implementation** needs to be determined so that the likelihood of allergen cross-contamination can be assessed and provide a level of confidence in your practices.
- ☐ **Designated allergen storage and handling areas** need to be identified on the floor plan with the corresponding control measure communicated to staff.

The allergen mapping process will be a key part of the validation process for any finished product with allergen 'free from' claims and will provide the rationale or justification for allergen cross contact labelling.

This process will help demonstrate all reasonable precaution and due diligence to allergen management in your facility.

Protect your business and your brand

BSI believes the world should be supplied safe, quality food. Allergens are only one of many significant issues faced by food manufacturers in production and consumers as they live their daily lives. BSI has extensive training and auditing capacity as well as supply chain management tools that can help organizations build resilience against the challenges and threats faced by today's food industry.

This guide can help support the implementation of the food safety standards outlined below that can reduce the risks faced by your organization; protecting your brand and your bottom line.

BRC Food Safety

The BRC Global Standard for Food Safety specifies the food safety, quality and operational criteria to fulfil compliance obligations and protect the consumer. It's flexible enough to allow extra voluntary modules to reduce the audit burden while reducing exposure to fraud and promoting transparency and traceability in the supply chain.

FSC 22000

FSC 22000 is specifically designed for food manufacturers and sets out the requirements for the implementation and operation of a food safety management system. It incorporates many of the principles of other GFSI (Global Food Safety Initiative) approved food safety standards, so FSSC 22000-certified organisations also meet the requirements of several global retailers and large-scale food companies under a single, internationally recognized food safety management system.

SQF

The Safe Quality Food Programme (SQF) is an internationally recognized certification system, emphasizing the systematic application of HACCP for control of food quality hazards as well as food safety. Recognized by the GFSI, the implementation of an SQF management system addresses a buyer's food safety and quality requirements .

BSI Supply Chain Management Tools

BSI VerifEye

Our supplier verification service gives your organization the on-site, third-party professional visibility into your suppliers to effectively manage your supply chain and enterprise risks. Our verification audits give you cost-effective assurance that your suppliers are not exposing your brand to potential risks through accidental or intentional misrepresentation.

SCREEN Intelligence

Determine country risks using our web-based intelligence platform with country risk maps for social, environmental and security issues. This web-based tool assists companies in identifying and understanding their supply chain security, business continuity and corporate social responsibility needs and threats.

Appendix 1

Example of a completed raw material allergen matrix

Ingredient	Supplier	Peanut	Tree nut	Egg	Milk	Gluten	Soy	Sesame	Fish	Crustacea	SO2 >10mg/kg
Wheat flour	Dingo Flours	N	N	N	N	P	T	N	N	N	N
Salt	Salty Company	N	N	N	N	N	N	N	N	N	N
Yeast	Bakers Ingredients	N	N	N	N	N	N	N	N	N	N
Kibbled grain mix	NZ Grain Company	N	N	N	N	P	N	C	N	N	N
Sesame	Seeds of India	N	N	N	N	N	N	P	N	N	N
Sultanas	Sun Fruits	N	N	N	N	N	N	N	N	N	P

Key

P = Present

C = Potential for cross contact from shared equipment or same processing line in our facility

T = Trace allergen may be present through cross contact from our facility or from supplier

N = Not present

Appendix 2

Example of a finished product allergen matrix

Product	Peanut	Tree nut	Egg	Milk	Gluten	Soy	Sesame	Fish	Crustacea	SO2 >10mg/kg
White bread	N	N	N	N	P	T	C	N	N	N
Multigrain bread	N	N	N	N	P	T	C	N	N	N
White rolls	N	N	N	N	P	T	C	N	N	N
Sesame topped rolls	N	N	N	N	P	T	C	N	N	N
Fruit bread	N	N	N	N	P	T	C	N	N	P

Key

P = Present

C = Potential for cross contact from shared equipment or same processing line in our facility

T = Trace allergen may be present through cross contact from our facility or from supplier

N = Not present

Appendix 3

Example of a allergen risk assessment flow diagram

<table>
<tr><th>Process step</th><th>Peanut</th><th>Tree nut</th><th>Egg</th><th>Milk</th><th>Gluten</th><th>Soy</th><th>Sesame</th><th colspan="2">Fish, Crustacea, SO2 >10mg/kg</th></tr>
<tr><td>Ingredient receival & storage</td><td rowspan="13" colspan="4">No risk –
Not used on site</td><td rowspan="13">Intentionally added ingredient</td><td>Low risk – May be present as trace in flour received</td><td>Low risk – Designated storage in common warehouse area</td><td rowspan="13">No risk –
Not used on site</td><td>Low risk – Designated storage in common warehouse area</td></tr>
<tr><td>Weigh up</td><td>Medium risk –Handled in same area however designated storage bins; separate utensils used for weigh up; dust extraction used; compressed air not used for cleaning</td><td>Medium risk – Handled in same area however designated storage bins; separate utensils used for weigh up; dust extraction used; compressed air not used for cleaning</td><td>Low risk – Present in sultanas only. Sultanas weighed last in production day.</td></tr>
<tr><td>Mixing</td><td rowspan="9">Low risk –
Dough baked in unique batches with full clean down between different batches</td><td>No risk – Not used in this area</td><td rowspan="9">Low risk – Fruit dough baked made and baked last in production day with full clean down between different batches</td></tr>
<tr><td>Dough diving</td><td>No risk – Not used in this area</td></tr>
<tr><td>Proof dough</td><td>No risk – Not used in this area</td></tr>
<tr><td>Addition of topping - sesame</td><td>High risk</td></tr>
<tr><td>Bake</td><td>Medium risk – Used in area in different oven</td></tr>
<tr><td>Cool</td><td>Medium risk – Used in area in different line</td></tr>
<tr><td>Pack & label</td><td>High risk – Used in area with no physical segregation between packing lines</td></tr>
<tr><td>Finished product storage</td><td rowspan="2">Low risk – Product fully enclosed in packaging however sesame seeds are sticky particulate allergens that may be present in environment</td><td rowspan="2">No risk – Product fully enclosed in packaging</td></tr>
<tr><td>Dispatch</td><td>No risk – Product fully enclosed in packaging</td></tr>
</table>

Appendix 4

Example allergen map