

Food allergen risk assessment and risk management

Are you concerned about allergenic proteins in food products that your company produces or provides? TNO offers a solid research and expertise base that we commit to developing practical solutions for food business operators. By quantification of allergen risks and support in allergen management, we help you to deliver safe products for allergic consumers.



Allergens in food are a risk for the allergic consumer population. Traces of allergens due to cross-contact of raw materials or during transport or production pose a particular concern. Currently, many food producers struggle with the question of how and when to quantify the risks of presence of allergens due to cross-contact and how to use this in allergen management and risk communication. Current EU regulation only contains a list of food allergens which must be declared on packaging whenever these, or ingredients derived from these, are used at any level in food production. Clear regulatory guidance regarding the management of and communication regarding unintended allergen presence is lacking. TNO experts provide support to individual companies as well as in international projects and expert panels aimed at the acceptance and implementation of quantitative allergen management approaches.

Quantification of the risk for allergic reactions

For years, TNO research focusses on improving allergen risk assessment methodologies and generation of relevant data for improving product safety for allergic consumers. The risk for an allergic reaction depends on the concentration of the allergenic protein in a food product, the quantities of the food that are eaten by allergic consumers, and the sensitivity of the allergic population for the allergenic food.

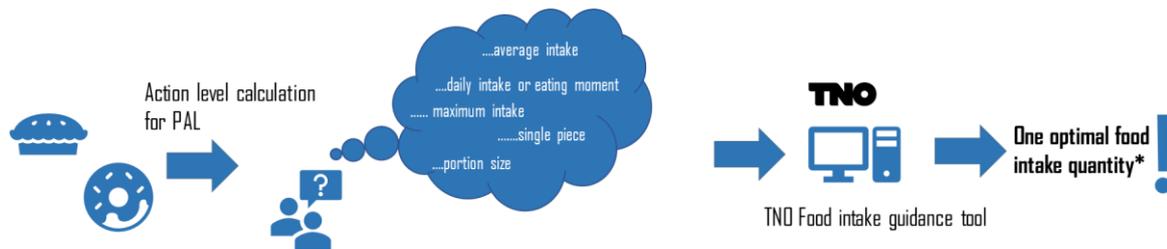
Since 2009, in collaboration with our partners at the Food Allergy Research and Resource Program (FARRP) of the University of Nebraska in the US, we collect data on thresholds for most major allergenic foods. We host the largest threshold database worldwide that now contains over 3400 individual datapoints. Results of analyses of these data are used, for instance, as Reference Doses for precautionary allergen labelling in the Australian/New-Zealand VITAL® (Voluntary Incidental Trace Allergen Labelling) program (<http://allergenbureau.net/vital/>) and Reference Doses are increasingly adopted by food safety authorities.

In food allergen risk assessments and in VITAL® action level calculations, assumptions need to be made regarding the amount of a food eaten by allergic individuals. The consumption amount assumed is critical as it will affect the outcome of a risk assessment and a decision whether or not to apply a precautionary allergen warning on your product. TNO therefore investigated the optimal choice for food intake values based on food consumption data from the United States and North-Western European countries.

Quantitative risk assessment gives insight into the relevance of concentrations of allergenic proteins detected in food products. Based on our long-standing experience in risk assessment in combination with large supporting databases, our expertise warrants solid evidence-based and actionable quantification of risks of allergenic proteins.

Food intake guidance tool

Besides offering our expertise to requests from individual food companies or authorities, we are currently developing an online tool to guide food companies to the most appropriate food intake values for their individual product portfolio. The tool will provide a risk assessment and action levels for precautionary allergen labelling attuned to your specific products. This project is still open for new partners to support and accelerate this key innovation step towards harmonization of quantitative risk assessment and risk management.



* scientifically underpinned selection of the optimal food consumption estimate for allergen risk of foods using data of national food consumption surveys

Allergen risk management strategy

Food business operators want to avoid allergic reactions among their consumers and minimise consumer complaints. In terms of allergen management, a food manufacturer is faced with the main question of how to avoid or reduce potential cross-contamination of their products with allergenic proteins by taking appropriate risk management measures.



TNO offers a risk-based approach to support companies in their management of cross-contamination and appropriate decisions regarding the use of precautionary allergen labelling. Our approach combines your company's knowledge of the production processes and TNO's knowledge of food intake, risk assessment and risk management of food allergens, resulting in an evidence-based allergen risk management strategy that ensures safe food products.

Our Food Allergen Risk Assessment and Risk Management Services :

- Support in deriving appropriate food intake values for your products
- Quantitative allergen risk assessment
- Well defined action levels for precautionary allergen labelling
- Advice regarding labelling needs with expert statements
- Efficacy assessment and advice on improvement of in-factory cleaning procedures
- Investigation of contamination patterns, including peak and particle cross-contamination
- Risk analysis of cross-contamination for:
 - o Raw materials and ingredients
 - o Manufacturing process at supplier
 - o Production facilities and equipment
 - o Storage and transport

More information

Our team is happy to discuss how we can support you to address your specific needs tailored to your product development pipeline and your product portfolio. Please contact [Bas Kremer](#)

Key references:

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- Houben GF, Baumert JL, Blom WM, Kruizinga AG, Meima MY, Remington BC, Wheeler MW, Westerhout J, Taylor SL. Full range of population Eliciting Dose values for 14 priority allergenic foods and recommendations for use in risk characterization. *Food and Chemical Toxicology* 2020; 146, 111831. <https://doi.org/10.1016/j.fct.2020.111831>