

Food allergies: the enemy within

Allergy to peanut is one of the most common food allergies in the UK, but surprisingly unknown in Greece. The EU-funded four-year project, EuroPrevall, has shown that the triggers of food allergy vary greatly from country to country, findings that have important implications for people with food allergies, the food industry and society as a whole.

With this project, researchers for the first time have a realistic idea of how many people suffer from food allergies, what they are allergic to, and which foods cause the most problems in different age groups.

To help harmonise the testing of food allergens, new international guidelines co-authored by the European Commission's Joint Research Centre (JRC) provide a common framework for testing of food allergens worldwide and facilitate these important cross-border comparisons.

EuroPrevall's coordinator, Professor Clare Mills of the UK's Institute of Food Research, commented: "Effective strategies for coping with food allergies, on a personal level and in society, rely on accurate information on the size and root causes of the problems, and until now that information just hasn't been available. What we are seeing are major differences in the foods that trigger allergies in different areas. Even within countries there are significant variations. For instance, here in Turin apple juice allergy is extremely rare, but if you travel to the south of Italy it becomes a more common allergy trigger."

Franz Ulberth of the JRC's Institute for Reference Materials and Measurements, added: "For the first time, national authorities carrying out official food allergen controls have a common basis for accepting validated testing methods. Consumers allergic to certain food ingredients will benefit from an increased level of protection by the availability of harmonised and reliable testing methods, and international trade will be facilitated by applying mutually-agreed testing protocols."

Differences across Europe

In the EuroPrevall project, around 70,000 people from 23 countries were assessed, including a cohort of 12,000 children from nine European countries who were followed from birth. Using a single, standardised test gave accurate levels of the prevalence of allergies to a range of different foods items comparable across different countries. The project has also extended beyond Europe into other countries, including Ghana, Russia, China and India. The data are still being analysed and is due to be published in full in early 2011. But, clearly no single number or simple list of foods will be possible. Instead, the prevalence of food allergies in different age groups is caused by a variety of foods, which are different in different areas.

“There is a lot of food allergy in Amsterdam to many different foods, but there is a lot less food allergy in Athens, and surprisingly no reported allergy to peanut, which is one of the commonest food allergies in the UK,” said Prof Mills. “Shrimp allergy is frequent in Iceland and Spain, but virtually absent in Bulgaria and Poland.”

“We hope that this kind of new, reliable information will allow the development of evidence-based risk assessment strategies that will improve the use of precautionary statements on food packaging, so benefitting consumers and health professionals.” The project has been measuring the social impact allergies have on sufferers and their families, as well as the wider economic impact allergies cause to society in general.

In addition to the data on geographical distribution of allergies, the project also recorded infant feeding habits, environmental influences and genetic factors to help figure out what causes food allergies. For example, there is a cross reaction between birch pollen allergy and allergy to certain proteins in apples. The geographical distribution of birch trees is mainly confined to Northern Europe, which explains why there is a difference in the distribution of allergy to these apple proteins.

Understanding what causes allergies to arise, in conjunction with data about the geographical spread of different food allergies, will lead to better management of the problems associated with allergies, assisting in their prevention through, ultimately, to designing cures.

It isn't difficult to see how the lack of consistent information has caused major problems for food manufacturers, processors and retailers, as well as consumers. Previous estimates of food allergy varied widely, with different testing and reporting regimes in different countries making cross-border comparisons impossible.

Protection through better measurements

The European Commission's Joint Research Centre (JRC) has co-authored new international guidelines which should better protect consumers, by promoting the harmonised, accurate and reliable testing of potentially lethal food allergens by analytical laboratories worldwide.

The guidance document¹ is the result of several years of negotiation by a high-level collaboration of experts from regulatory agencies representing Canada, USA, Australia, Japan, the European Union, academic research institutions, and food allergen test-kit manufacturers, under the auspices of the Association of Analytical Communities (AOAC) Presidential Taskforce on Food Allergens.

The new guide is important because consumers depend on truthful labelling of food products to avoid allergic reactions. Accurate labelling is only possible if an internationally-agreed set of validated testing methods that are reliable and robust is available.

¹ Abbott M, Hayward S, Ross W, Godefroy S, Ulberth F, Van Hengel A, Roberts J, Akiyama H, Popping B, Yeung J, Wehling P, Taylor S, Poms R, Delahaut P. *Validation Procedures for Quantitative Food Allergen ELISA Methods: Community Guidance and Best Practices*. JOURNAL OF AOAC INTERNATIONAL 93 (2); 2010. p. 442-450

The use of so-called ELISA testing methods (enzyme-linked immuno-sorbent assay) to detect food contaminants and residues is fairly well established. However, the new guidance document addresses for the first time the validation of ELISA testing methods for food allergen analysis in a harmonised way.

Food allergens are proteins, which are large and complex molecules. Scientists have to target the right mixture of protein markers in food samples to reliably detect the presence of food allergens. The targeted proteins have to meet multiple criteria, such as the efficiency with which they are extracted from the food sample and the ability to withstand food production processes like roasting and extrusion.

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Notes to editors

EuroPrevall, The Prevalence Cost and Basis of Food Allergy Across Europe

www.europrevall.org

63 Partners from 23 countries including Europe (UK, NL, D, B, S, F, I, IRL, E, GR, PL, CZ, HU, IT, CH, A, DK, IS, BG, RU) Africa (Ghana) and Asia (India, China) with collaborating centres from USA, Canada, NZ and Australia

The project established a standardised procedure to measure allergy rates. The test consists of a chocolate mousse that can be spiked with potentially allergic foods. Trained teams feed the mousse to volunteers, increasing the amount of allergic ingredients until there is a reaction. On a different day, the procedure is duplicated with unspiked mousse, and neither the volunteer nor the testing team know which is the placebo. This kind of test, a double-blind placebo-controlled food challenge test, is the gold-standard test to detect allergy to foods.

The Institute of Food Research, UK

The mission of the Institute of Food Research (www.ifr.ac.uk) is to undertake international quality scientific research relevant to food and human health and to work in partnership with others to provide underpinning science for consumers, policy makers, the food industry and academia. It is a company limited by guarantee, with charitable status, grant aided by the Biotechnology and Biological Sciences Research Council (www.bbsrc.ac.uk).

The Joint Research Centre

The Joint Research Centre (<http://www.jrc.ec.europa.eu>) is a Directorate-General of the European Commission providing independent scientific and technical support to European policymaking. The JRC's Institute for Reference Materials and Measurements (IRMM) promotes a common and reliable European measurement system in support of EU policies (<http://irmm.jrc.ec.europa.eu>). The prime objective of the JRC-IRMM is to build confidence in the comparability of measurements by the production and dissemination of internationally accepted quality assurance tools, including reference materials, validated methods, reference measurements, interlaboratory comparisons and training.

