Risk assessment of unintended allergens in food: can we use food consumption data from the general population?

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**Background and Aim:** Risk is a function of hazard and exposure. For food products, allergens are a well-known hazard and exposure scenarios are calculated based on the concentration of unintended allergen in combination with the amount of food consumed. At the moment, food consumption data from the general population are used for calculating exposure scenarios in food allergen risk assessments. A reasonable assumption is that if a food product is chosen to be consumed, the population distributions of amounts of a food product consumed at one eating occasion are comparable between the allergic population and the general population. A second assumption is that the frequency of consumption for certain product categories may differ between the allergic and general populations. However, structured data are lacking to underpin these assumptions and research initiatives are needed to fill in the current data gaps.

**Methods:** Based on the US National Health and Nutrition Examination Survey, a statistical comparison was made between the food consumption distribution at a single eating occasion of allergic and non-allergic individuals. Two allergic identifiers were studied, serum IgE to the specific food (NHANES 2005-2006) and self-indicated food allergy (NHANES 2009-2010). The food allergens studied were: shrimp, wheat, cow’s milk, egg, fish, shellfish, peanut and other nuts. Food consumption was compared at the food group level. A total of 103 food groups were defined. The statistical difference was tested with ANOVA or chi-squared test.

**Results and Conclusion:** Overall, the results indicated that the criteria for allergy were not strong enough in the NHANES survey and that non-allergic individuals were mixed with the allergic population. Therefore, it was not possible to make a conclusion about the validity of the assumptions applied in risk assessment when using food consumption data from the general population. More comprehensive and structured studies are needed to ascertain the differences in consumption patterns of allergic and non-allergic individuals. Ideally, any future study should identify clinically-diagnosed food-allergic individuals and measure their food consumption patterns using the same method as the general population.