SciCom

Scientific Committee of the Federal Agency for the Safety of the Food Chain

Advice 24-2017 of the Scientific Committee of the FASFC on the reference doses for the allergens mentioned in Annex II of Regulation (EU) N° 1169/2011 of 25 October 2011

Background & Terms of reference

Regulation (EU) N° 1169/2011 requires labeling of fourteen intolerance or allergy causing substances when they are used in the production or preparation of a food.
In the absence of legal notification thresholds or reference doses for food allergens, risk evaluation of allergens within the FASFC is currently based on the 'Voluntary Incidental Trace Allergy Labeling' (VITAL® 2.0) reference doses, developed by the Allergen Bureau of the Australian food industry. Recently, however, the Dutch Bureau for Risk Assessment and Research Programming (BuRO) of The Netherlands Food and Consumer Product Safety Authority (NVWA) proposed alternative (provisional) reference doses that are for most allergens 10 times lower than the VITAL® 2.0 reference doses.
The Scientific Committee has been asked to propose reference doses for the allergens of crustaceans, eggs, fish, peanuts, soybeans, milk, celery, mustard, sesame seeds, lupin, molluscs and certain nuts, listed in Regulation (EU) n° 1169/2011. Based on these reference doses, the majority (95 to 99%) of the allergic population should be protected and appropriate measures may be taken when undeclared allergens are detected.

Methodology

The opinion is based on information from the scientific literature in combination with opinion expert opinion.

Scientific argumentation

For the risk assessment of allergens, similar principles can be used as for 'classic' contaminants. Nevertheless, there are some important differences. Various allergens are common ingredients, which only represent a hazard to a limited group of consumers. In susceptible persons, allergens will cause a reaction very quickly after ingestion, varying from itching, over diarrhea or vomiting to life-threatening anaphylactic shock. The severity of the reaction depends on the nature and the properties of the allergen, the ingested allergen dose and the physiological condition and genetic background of the person. Unlike 'classic' contaminants, the threshold at which an allergen provokes an adverse reaction is not expressed as an amount per kg body weight but as an absolute amount of protein of the allergenic commodity.

The allergenic threshold for a population or the eliciting dose (EDp) that causes a response in a certain percentage of the susceptible population, is derived through statistical modeling of individual threshold distributions. An overview of EDp values reported in the literature for various allergens, is given in the opinion.
The VITAL® 2.0 reference doses are based on expert opinion and correspond to the ED01, the lower limit of the 95% confidence interval of the ED05, or both that are modeled by Remington (2013) and Taylor *et al*. (2014) by means of a Weibull, a log-logistic or a log-normal distribution. Reference doses proposed by the BuRo correspond to the lowest ED01 values obtained by means of the Weibull model of the same studies on which VITAL® 2.0 reference doses are based.

There are however, indications that a reference dose based on an ED01 is quite low in practice. It was shown that when a large, sensitive test population was exposed to a peanut dose corresponding to the ED05, a reaction was observed in less than 5% developed an allergic response. In addition, the Weibull model appears to deviate from the actual data and thus to overestimate the population sensitivity for most allergens at the lower dose-end of the distribution.

Therefore the Committee proposes to use the lower limit of the 95% confidence interval of the ED05 as reference dose for risk assessment of allergens. Preference is given to the lowest value obtained by means of a log-logistic or a log-normal model on the largest dataset available.

Following reference doses (expressed as mg protein of the allergenic commodity) are proposed by the Scientific Committee for risk assessment:

Allergenic commodities	Proposed reference dose (mg protein)
Peanut	1.1
Milk	1.2
Egg	0.3
Hazelnut	0.5
Walnut	0.5
Cashew	0.6
Other nuts	0.5
Soybean	2.9
Wheat (and all cereals containing gluten)	1.3
Mustard	0.1
Lupine	4.5
Sesame seed	0.4
Shrimps	12.1
Crustaceans	-
Molluscs	-
Fish	-
Celery	-

At present, insufficient threshold dose data are available in literature for deriving a reference dose for nuts other than hazelnut, walnut and cashew. Results for hazelnut, walnut and cashew however, indicate that the threshold doses, and consequently the reference dose, of hazelnut may be considered as (provisional) alternative for the risk assessment of other nuts, for which threshold doses are lacking (almonds, pecan nuts, Brazil nuts, pistachio nuts, macadamia or Queensland nuts).

A similar extrapolation of the proposed reference dose for shrimp to other crustaceans, such as lobster and crab, is currently not possible as the current, by available data are insufficient to support such generalization. Available knowledge in the scientific literature is currently also too scarce to allow the derivation of a reference dose for the allergens of molluscs, fish and celery.

Although not specifically mentioned in the question, the Committee wishes additionally to point out the dualism of gluten-containing cereals (wheat, rye, barley, oats, spelt, kamut).

Such grains must be avoided by persons suffering gluten intolerance, but also by persons with a cereal allergy. According to Commission Implementing Regulation (EU) n° 828/2014, the statements “gluten-free” and “very low gluten” are allowed on products that contain no more than 20 mg/kg and 100 mg/kg of gluten respectively. Nevertheless, Regulation (EU) n° 1169/2011 always requires labeling of cereals containing gluten when they are used as an ingredient. In view of protecting consumers with an allergy to these cereals, the Committee proposes to apply the reference dose derived for wheat for risk assessment.

Conclusion

The Scientific Committee proposes (provisional) reference doses for the allergens of peanuts, milk, eggs, nuts (hazelnut, walnut, cashew and other nuts), soybeans, mustard, lupin, sesame seeds, shrimp and wheat (and with extension, for other cereals containing gluten as well). These reference doses are mainly based on the lower limit of the 95% confidence interval of the dose that elicits an allergic reaction in 5% of the susceptible population (ED05) reported in the scientific literature. Based on available information and taking uncertainties into account, it can be assumed that these reference doses are sufficiently low to protect the majority of allergic consumers (97 to 98%). For the allergens of crustaceans, molluscs, fish and celery, the available information is currently insufficient for proposing a reference dose.

The proposed reference doses are based on current knowledge and are of a 'temporary' nature. With further developments of knowledge and data, reference doses should be reevaluated.
The information presented in this scientific opinion fits in the context of managing the risk that may arise from the presence of allergens in foods. Regardless of the control of the possible presence of undeclared allergens, the proposed reference doses do not, in principle, concern allergens which have been added as an ingredient to food products, as they are part of the product recipe and should always be labeled according to legislation. The proposed reference doses should not be used as a basis for claiming a product to be "free" of a specific allergen. Furthermore, the use of precautionary allergen labeling (PAL) for the potential, sporadic presence of an allergen through cross contamination should be minimized by a proactive allergen management system. Application of such labeling should always be linked to a real risk based on the applied manufacturing process as described in the context of the HACCP – ‘Hazard Analysis and Critical Control Points’ system.

The full text is available on this website in dutch and in french.