Intermolecular relationships affecting the functionality of food systems

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We assist nowadays to an intensification of research efforts for rigorously controlling the food quality, safety and security. The most important factors influencing the prevalence of food allergies are genetic predisposition, lifestyle, environment, or a combination of all these factors. No cure for food allergies has been reported yet, and prevention through the avoidance of food allergens is currently the only way of managing the health consequences in case of allergic consumers. Therefore, the knowledge of the effect of food processing on stability and digestibility of allergen proteins is crucial for developing 'allergy safe' food products. Extensive research was focused on some of the most important allergens from wheat, soy and eggs, and aimed at identifying suitable processing techniques for reducing their allergenic potential.

These issues were the main objectives of the project **A bottom-up approach on the effects of food processing on the allergenic potential of food proteins**, acronym **AlergenFree** developed between 2015 and 2017 by the „Dunărea de Jos" University of Galati and UEFISCDI (www.uefiscdi.ro) (PN-II-RU-TE-2014-4-0618, Contract No. 12/2015).

The project was focused on some of the most important allergens from wheat, soy and eggs, and aimed at identifying suitable processing techniques for reducing their allergenic potential. An integrated bottom-up approach, going from the atomic level details on protein structure to the macroscopic organization of food matrices, was used to test the effect of thermal and non-thermal processing on the allergenic potential of the proteins. Finally, the optimal combinations of thermal and non-thermal processing steps were applied for developing new food products with reduced allergenic potential.

Taking into account the innovative character of the approach proposed here, one might expect that the research will open new research directions. One ambitious goal is to transform the qualitative knowledge about the influence of thermal and non-thermal processing on the allergenic potential of food proteins into a quantitative knowledge base for processors, therefore supporting *innovation in food industry*.

More details about the project: www.alergenfree.ugal.ro