RISK EVALUATION OF ALLERGENS IN FOOD PRODUCTION PROCESSES IN FUNCTION OF PROCES-, PRODUCT- AND INSTALLATION PARAMETERS

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Minor quantities of allergenic proteins in foods can have an effect on the allergic consumer. The carry-over of allergens in production systems is realistic. Residuals of allergens out of the former production batch can contaminate the latter production batch. Also ineffective cleaning of production systems can give rise to cross-contamination. Due to this, the control of allergens, accidently present, becomes more and more a challenge in the food industry.

Cross- contamination of allergens can be influenced by different factors. Firstly, the composition of the food product (fat, proteins, sugars, starch), viscosity and pH can determine the level of cross-contamination. Secondly, process parameters as the flow and temperature will also have an effect. Next to this, the complexity of the production system like contact materials, processing units, turns and valves can play a role in the adhesion process of allergens in production systems.

In a first stage, the cooperating food enterprises were visited to gather data of their products, production processes and cleaning programs. Subsequently, these data were compiled and evaluated to make a design of experiments. In a following step, simulations of processes with different conditions are tested in a pilot plant. Simultaneous, different cleaning programs are evaluated. For the open production systems, process units like kneaders, cutters are evaluated.

The testing material in the pilot plant is self-made media simulating ‘real’ food products. These are spiked with indicator allergens. Samples are taken at different places in the pilot plant and are analyzed. For soy-proteins, Q-PCR techniques are used. Casein (milk protein) and lysozyme (hen’s egg protein) are analyzed with HPLC. Different simulations are conducted in order to simulate allergen adhesion and cross-contamination in function of the selected product, process and installation parameters.

Results of these experiments are used to create predictive models on the carry-over of allergens in production processes in function of product-, process- and installation parameters. This can give rise to the construction of practical simulations models for the food industry in the frame of a risk evaluation of the carry-over of allergens between different production batches. It will allow the food industry as well to validate predictive measures taken to prevent cross-contamination of allergens between different production batches.