FLAVOUR GENERATION UPON FOOD PROCESSING - REVEALING THE REACTION PATHWAYS IN COMPLEX FOOD SYSTEMS

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Flavour of foods is without doubts one of the key consumer preference drivers and consequently its optimization is of a crucial importance for food manufacturers. Thermal processing, such as roasting, baking, toasting, extrusion, cooking, frying, etc. trigger significant changes in key product attributes, including color, flavor and texture. From the chemical point of view these thermal processes are very complex as many reactions happen in parallel and compete for precursors and intermediates. A careful control of the process parameters based on deep understanding of reaction pathways is required to enhance generation of beneficial compounds (aroma, taste, bioactives) while mitigating undesirable ones (e.g. acrylamide) and thus to ensure high product quality. The complexity of the real food systems makes it difficult to study the reaction pathways directly in the food matrix, therefore simplified model systems are often used instead. The results of such studies provide some useful information, but may not always reflect the reality of a complex food system. Consequently, findings obtained from model studies should be validated in a real food environment. Using new as well as already published data on coffee roasting and cereal extrusion (1-3), the lecture will illustrate different approaches that are used in our laboratories to elucidate the flavor generation pathways in complex food systems. Special attention will be paid to the labelling experiments employing sugars or amino acids including the CAMOLA method (carbohydrate module labelling) (4).

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