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Foreword

Interaction of food matrix with small ligands influencing flavour and texture

COST Action 96 "Interaction of food matrix with small ligands influencing flavour and texture" was launched on 6 January 1995 during the first Management Committee (MC) meeting held in Brussels. In 10 meetings the Action brought together around 80 participants from 40 laboratories and 15 countries. Four working groups (WG) were constituted and their coordinators managed the scientific programmes. Using the opportunity of 'short term scientific missions', there was an exchange of experiences acquired by the different scientists.

Flavour attributes to the acceptability of food to the consumer, in particular to the demand for healthier foods, which contain less fat, sugar and salt. A modification of the formulation of a product induces alterations in flavour quality, Therefore, the industry has generated a keen interest in basic knowledge regarding the influence of the food matrix on flavour release and perception. The systematical development of products with acceptable flavouring properties will only be possible, when the flavour binding behaviour of food ingredients has been thoroughly elucidated.

Previous studies of interactions between components involve mainly simple mixtures, i.e. model systems consisting of water, a volatile substance and a non-volatile constituent. Frequently, the data have been obtained under inadequately specified conditions, and/or a wide range of conditions have been used, making generalizations quite impossible. There are only a few reports regarding the nature of the interactions, even in simple systems, and only a few studies have been realized on real food systems. These studies do not deal with the effect of mastication and other in-mouth conditions on flavour release.

The main objective of WG 1 (kinetic and thermodynamic constants) was to make a critical overview of the thermodynamic and kinetic data, and to demonstrate their importance for developing physico-chemical models in flavour release. Different laboratories choose a model system with β-lactoglobulin and different flavour compounds to study the kinetic and thermodynamic constants. New methods were investigated, such as affinity chromatography and fluorescence spectroscopy, which gave information on the conformation of the protein and its changes due to the fixation of small ligands.

Theoretical modelling was studied in WG 2, which can play an important role in the science of flavour release (product formulation and understanding of sensory data). Mathematical models were elaborated to study flavour release from solid and semi-solid foods, as well as liquid emulsions for investigating the dilution effects on flavour release. Model systems were used to explain flavour release from real food systems, such as soft drinks. They predicted, that different saliva flowrates will influence the rate of flavour release between individuals.

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Dynamic sensory methods were developed in WG 3 to study the perception of flavour. Comparisons between time/intensity measurements and nose space analyses showed that the rate of release was better correlated with perception intensity than with maximum curve intensity. Nose space analysis was also coupled to GC-olfactometry in order to quantify odour active compounds.

WG 4 focussed both on instrumental methods giving a better understanding of the structure and texture of the matrix, and on its influence on the binding or release of aroma compounds. Three categories of matrices were defined: proteins, polysaccharides and neutral polymers. A special effort was made to analyse some key features for describing on a common basis the binding and/or release properties of different matrices, i.e. proteins (β-lactoglobulin; gelatin, meat), neutral polysaccharides (maltodextrins, cellulose, starch), charged polysaccharides (pectins, alginates), others (melanoidins)...

The final meeting of the Action was held at Universita degli Studi di Udine, 23–24 September 1999. It was organised by Prof. Alessandro Sensidoni, Dr. Paola Pittia and Prof. Carlo Raphaele Lerici (in memoriam). Thanks to the scientific committee and the Editor of *Food Chemistry*, Dr. Jacques P. Roozen, this special issue reproduces the main contributions presented at that meeting.

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