IUFoST 2006
DOI: 10.1051/IUFoST:20061383

IUFOST2006/1383
Bio-molecular self-assemblies on a nanometer scale: a way to improve food quality ?

M. Axelos
INRA, BIA-ISD - Rue de la Géraudière - BP 71627, 44316 Nantes cedex 3, France
axelos@nantes.inra.fr

Nowadays, we are much more aware of the importance of food's contribution to improve quality of life and reduction of risk factors of chronic diseases. Attempts are being made to supply consumer with food enriched in biologically active molecules including vitamins, antioxidants, long- chain cis unsaturated fatty acids and many others. In general most of these added molecules suffer from a lack of solubility in the different phases of complex foods and are very sensitive to oxidation during processing and storage. The challenge is to simultaneously maintain the functional properties and processing ability of the food matrices while improving significantly their nutritional profile. One way to accomplish this goal is to develop nano-sized molecular assemblies such as coacervates, nano-emulsions, proteins aggregates, etc. Such systems, because of their size, are easily soluble and stable and they have an improved bioavailability. Furthermore, using nanometric entities leads to a larger surface area. Interfaces may then be designed to built molecular traps, to control diffusion of solutes, to manipulate the reaction kinetics and to elaborate new textures. Through examples, we will evidence the key role played by molecular assemblies in determining the properties of the interfaces. The need to develop a multiscale approach from molecular to supramolecular organisation will also be discussed.