



Insights from scattering into plant based dairy products

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The importance of sustainable human nutrition is growing with the increasing effects of the climate change. Usually, emulsions systems like milk are composed of unsustainable, animal derived milk proteins, phospholipids, oil and water. To increase the sustainability of emulsion systems, milk proteins are substituted with sustainable plant proteins, whereby the stabilization mechanisms, and the long-term stability of these sustainable emulsions are of interest. A central role within the stabilization mechanisms of emulsions play proteins and phospholipids, since they stabilize the oil/water interface as interfacial active components [1,2]. Proteins and phospholipids adsorb at the interface. In addition, these components may also interact with each other and may co-adsorb at the interface, depending on their molecular structure, origin, and the pH of the environment [3]. The interfacial stabilization undergoes with reorganization of the molecular structure of proteins. Small angle scattering experiments with neutrons and x-rays allowed to study the interfacial arrangement of β -Lactoglobulin as a standard milk protein, and different plant based proteins like Cruciferin from rapeseed or Rubisco, and their interaction with phospholipids at the interface. The results are leading to a systematic understanding of the interfacial properties of protein and phospholipid stabilized o/w interfaces. This knowledge will guide to a tailored formulation of food-based emulsion systems.

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