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Book Review

Eric Dickinson and Martin E. Leser (Eds.), Food Colloids: Self-Assembly and Material Science, RSC Publishing, Cambridge, UK, 2007 (xviii + 515 pp., £119.5, ISBN: 0-85404-271-5)

Food colloids are the multiphase systems that contain the main functional ingredients of food at the nano-scale or mesoscopic level. These systems may be emulsions, dispersions, gels or foams rich in different macromolecules and particles. Numerous reactions that occur between these ingredients may cause changes in properties of these food colloids and are strongly dependent on conditions of storage. Therefore control and improvement of the taste, texture and shelf-life of existing foods is very important in formulation of new high-quality products.

'Food colloids: Self-Assembly and Material Science' is a volume which discusses the most important aspects of food colloids such as structure, biopolymer interactions and different processes that occur in the systems. The character of nutrition is undeniably dependent on food structure and components (Chapter 1). Some ingredients, which are the elementary units of food such as polymers, colloids, proteins and droplets, may spontaneously self-assemble to create more complex structures. If we know the particular assembly mechanisms, then we can control them or modify them to produce a product with the desired properties (Chapters 2–5). Some crystals, e.g. lyotropic liquid crystals are known to self-assemble in lamellar, hexagonal and cubic symmetries which may be bicontinuous or become discontinuous in some cases, which lead to specific features of these structures (Chapter 6). While developing a functional food, some ingredients might have undesirable properties e.g. too bitter taste. Then these components may be included in food by their encapsulation and will not deteriorate the food quality (Chapter 7). Another important feature of food components is the electrostatic interactions between them (Chapters 9, 11–13, 15). For instance, some adsorption behaviour at liquid interfaces can be manipulated by changing protein-polysaccharide electrostatic interactions (Chapter 13). Particular attention is paid to the very important food colloid – milk. This solution of various molecules can be modified in different ways that results in many derivative products (Chapters 17–19).

Another very important area of food colloids is emulsions (Chapters 26–30). It is said that over 40% of processed food contains emulsified oils or fats. It is important from the dietary point of view – although the emulsified fat is included to impart the desired texture, structure and flavour to foods, the fat is also thought to be a major contributory factor to increasing levels of obesity and related conditions. Science has progressed so far that we can now study behaviour of emulsions in the mouth. It is concerned with the science called tribology, which investigates the friction, lubrication processes, and wear phenomena caused by surfaces sliding over one another. This approach is often used in high-pressure production processes, but some scientists are applying tribology to the low-pressure oral processing of food (31).

The volume "Food Colloids: Self-Assembly and Material Science" provides explanation of many processes and interesting topics concerned with food colloids. The book is a rich source of specialist information suitable for scientists working in nutrition or food areas but also for any researchers that are investigating the self-assembly of different molecules.

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