

Friction and Adhesion in Food Suspensions

Thomas Curwen, Mondelez International

“Wet” Food Suspensions are complex materials , frequently processed close to and above their jamming limits. They are characterized by: inhomogeneous particle populations; broad particle size distributions; diverse particle shape; diverse particle mechanics; and complex, occasionally multiple, fluid phases often containing surfactants. The presence of the fluid phase introduces important forces that modify and/or act in addition to friction and adhesion between particles: cohesion; lubrication; hydrodynamic. I have identified three areas of knowledge and capability required to enable us to further improve our processes and products: 1. Analytical methods, specifically rapid and robust methods to determine the MPF and characterise relevant bulk rheological properties to facilitate understanding, optimization and control; 2. Quantitative Microstructural Mechanistic understanding to aid proactive strategies to manage ingredient variation to maintain bulk properties key for efficient processing and quality control; 3. Computationally efficient Mathematical models to aid the efficient exploration of material behaviour in various unit operations.