
Computational modelling and engineering aspects of High Pressure Thermal Processing

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Innovative food processing technologies, such as high pressure processing at low and elevated to high temperatures, have gained increasing interest over the last decade as they can be applied to manufacture safe foods with better sensory and nutritional properties, and in fact induce textural changes in the product that can not be achieved by any other means. While high pressure processing at low temperatures (HPP) has been commercially applied for >15 years, high pressure thermal processing (HPTP) is yet to be commercialised due to the lack of equipment available that operates at high temperatures and industrial scale. HPTP has been hailed as the next disruptive technology in the food industry and will play an important role towards satisfying consumer demand for high quality, safe and innovative products. Computational Fluid Dynamics (CFD) has been established as a tool for characterising, improving, and optimising traditional food processing technologies; innovative technologies, however, provide additional complexity and challenges because of the interacting Multiphysics phenomena. This article will highlight Multiphysics modelling case studies, mainly from the authors institution, for the characterisation of various processing aspects and optimisation of HPTP.