

RESEARCH PROJECT

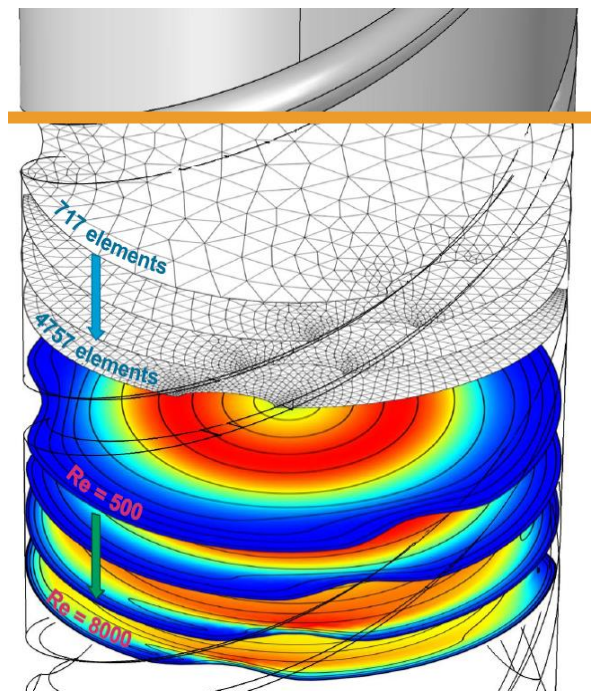
π Institute
Life Technologies

Micro-particulation of Whey Proteins: Reaction Kinetics in a Tubular Heat Exchanger

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Description Heat transfer processes including fluid mechanics are comparatively good described for low viscous fluids of a simple rheological character, but less good for moderate and high viscous fluids with a complex rheological behaviour. The last-mentioned type of fluids is frequently handled in food industry, during pre-drying steps for example, and is related to an important part of energy costs during food production. The aim of this project was to develop advanced geometries of tubular heat exchangers in order to achieve a higher efficiency of the heat transfer on the basis of an advanced understanding of flow dynamics. Furthermore, the interest was to elucidate the impact of combined shear and thermal stress on the molecular structure and functionality of food components processed in tubular heat exchangers. Re-designed tubular heat exchangers were applied in micro-structuring whey proteins (Kerche, F., Weterings, M., Beyrer, M., The effect of temperature and shear upon technological properties of whey protein concentrate: Aggregation in a tubular heat exchanger, International Dairy Journal, 2016. This technology allows creating a broad range of milk powders with specific thickening properties and thus replacement of non-protein thickeners used commonly in yoghurt or infant food formulas for example.



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