

Development And Deployment Of Simulation Based Approaches In Food Industry R&D

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Abstract

Food processes may seem flourishingly diverse at the outset, but the core lies in the movement of heat and mass, mechanics of materials, and transmission of electromagnetic fields. Since 2000, a move towards incorporating chemical and microbial kinetics into the engineering design to model the biochemical phenomena in food systems is on the rise. In this paper we will share our collective 15 years of COMSOL® software users experience with modeling of food industry multiphysics problems at various scales. In our research COMSOL software has been used for simulating general food engineering unit operations involving heat, mass, momentum transfer problems using COMSOL Multiphysics® built in add-on CFD, Heat transfer, Mixture, RF and AC/DC modules. We will share some examples where Physics and Application builder COMSOL module were used to create new multiphysics models.

Figures used in the abstract

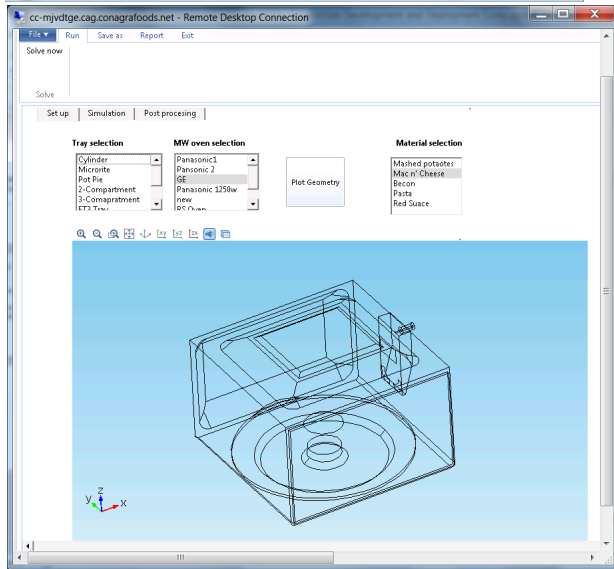
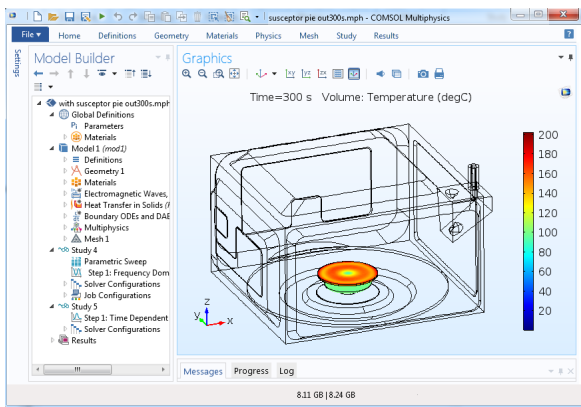


Figure 1 : Model development for MW heating of pot pie in domestic microwave oven.