

1145-35-2167

**Sean Deyo, Shawtaroh Granzier-Nakajima\*** (shawtarohg@email.arizona.edu), **Patricia Puente, H AH Shehadeh, Kevin Tully** and **J J B Webb**. *A Mathematical Model For Meat Cooking*. Preliminary report.

We present an accurate mathematical model for steak cooking based on Flory-Rehner theory for which we simulate numerically in two-dimensions. We model meat as a fluid-saturated poroelastic medium composed of a solid matrix (polymer) and fluid. As the temperature increases during cooking, a pressure gradient builds and induces fluid motion and deformation of the solid matrix, which also contributes to the motion of the fluid. Temperature distribution, fluid velocity field, moisture content, surface evaporation, and shrinkage are all modeled during the cooking process. Numerical simulations indicate good agreement with multiple sources of experimental data. Moreover, this work presents a new and computationally non-expensive method to account for shrinkage. (Received September 24, 2018)