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Model for electrical conductivity of muscle meat during Ohmic heating

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6 **Abstract**

A model is presented for predicting the electrical conductivity of muscle meat, which can be used for the evaluation of Ohmic heating. The model computes the conductivity as a function of composition, temperature and microstructure. The muscle meat is thought to be composed of protein, water, salt. Concerning the microstructure, the model takes into account the muscle fiber orientation with respect to the electric field, and the development of drip channels due to protein denaturation. The model includes a description of the protein denaturation kinetics. The model has been validated for different types of meat, varying in composition and heating rate. The submodel for protein denaturation is validated using independent DSC measurements. For meats heated faster than 20 degrees per minute, the conductivity is a linear function of temperature - due to the absence of protein denaturation, and thus drip channel formation. If meat is heated slower than 10 degrees per minute the conductivity is showing non-linear behaviour, with a significant decrease at temperatures above 70 degrees Celsius. This decrease is explained by the action of the complete protein denaturation. Our study

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