Food freezing and thawing time prediction with new simple calculation formulas application

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The objective of the paper was to present new simplified models for freezing and thawing time calculations. A new model for freezing time prediction based on Mott's methods was developed, with defining product shape factor and new formulation of enthalpy change during three stages of freezing and introducing constant characteristic freezing temperature of the product.

The new model for thawing time prediction based on observation of three thawing process stages was formed as well. The time of first and third thawing period was derived from heat balance equation, while classical solution of Plank was used for describing the second thawing period time. Both new models were verified using them for calculations performed on freezing and thawing data published. The prediction results and errors were mathematically examined comparing to the others of the same kinds of existing models and high accuracy in both cases was confirmed.