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Effects of Dielectric Properties on Temperature Distributions in Food Model during Microwave Heating

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To investigate heat transfer phenomena in cylindrical foods of different dielectric properties with microwave heating, the dielectric constant, loss factor and the temperature distributions of samples were measured. The temperature distributions changed with their dielectric properties (dielectric constant, loss factor and penetration depth). As the penetration depth increased, the region of high temperature moved from the surroundings of the cylinder to the center. To describe these phenomena theoretically, the temperature distributions in the samples were calculated under the same conditions as those in the experiments using the mathematical model. The calculated results agreed closely with the experimental values.

Keywords: [temperature distribution](#), [microwave heating](#), [dielectric properties](#), [heat transfer analysis](#), [mathematical model](#)


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