

# Radio-Frequency Heating in Food Processing: Principles and Applications (Electro-Technologies for Food Processing Series)



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**Radio-Frequency Heating in Food Processing: Principles and Applications (Electro-Technologies for Food Processing Series)** 

**Radio-Frequency Heating in Food Processing: Principles and Applications** covers the fundamentals of radio-frequency (RF) heating and the use of RF-heating technologies in modern food processing, preservation, and related industries. Focusing on industrial and lab-scale applications where RF heating has been employed successfully or reported to have potential benefits over conventional heating options, this state-of-the-art reference:

- Explains the similarities, differences, advantages, and limitations of RF and microwave heating as applied to agricultural products
- Describes fiber-optics temperature sensors and their utility in monitoring temperature during RF and microwave heating
- Discusses the dielectric and thermo-physical properties of agricultural products amenable to RF and microwave heating, presenting measurement techniques, mathematical concepts, and computer simulation models
- Provides practical perspectives on industrial RF units used in manufacturing food products, addressing free-running oscillators and 50- $\Omega$  designs for RF heaters and applicators
- Uses finite-element formulations to determine design parameters including resonant modes, circuit impedance, and electric field distribution in RF applicators
- Examines RF-heating effects on microorganisms, enzymes, and food quality attributes for products such as poultry, beef, pork, eggs, fish, milk, fruits, vegetables, and seafood
- Explores RF-heating applications beyond food processing, such as agricultural product deinfestation, waste treatment, counterfeit prevention, package tracking, and transportation of food from farm to table

**Radio-Frequency Heating in Food Processing: Principles and Applications** supplies an in-depth overview of the fundamental science and engineering principles governing RF applications, as well as a solid understanding of industrial RF unit design options, challenges, and opportunities for development.

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