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### OHMIC HEATING BEHAVIOR AND ELECTRICAL CONDUCTIVITY OF SOLID FOODS USING LOW AND HIGH FREQUENCY POWER SUPPLY

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**ABSTRACT** Ohmic heating is considered as a potential alternative to conventional heating processes. The heating occurs when an electric current passes through food, resulting in fast heating and short process times. In this study, experiments were conducted using an ohmic heating unit under different conditions: food materials, power frequency, high temperature and pressure. The experimental system consisted of a Teflon cylindrical cell (190mm length, 70 mm diameter, and 33 mm wall thickness) with two titanium electrodes, a power control unit with high frequency power source, and a data logger with several thermocouples. Fresh foods were cut (10-20 mm cubic particles), blanched (100°C for 3 min), blended in small particles (<5 mm), and then were put into the heating cell for tests (about 750 g). Under regular power (60 Hz), the EC of the ranked foods was as: radish > chicken breast > pork muscle > potato > carrot > beef. A higher frequency resulted in a larger EC, e.g., potato EC at 20 kHz was about 1.5 times of that at 60 Hz. There was a temperature peak at 100°C because of pressure build-up inside the cell, but this phenomenon didn't appear when temperature was raised to 130°C under pre-pressurized condition (2 kg/cm<sup>2</sup>).

**Keywords:** electrical conductivity, Ohmic heating behavior, high frequency, solid food