

ABSTRACT

A fryer (100) generates electromagnetic waves between a pair of opposed plate antennas (102) to control water that is an ingredient in food, specifically, a water activity of an object. The fryer (100) then applies a DC electric field of +100 V as an offset electric field on the water phase side relative to the oil phase in an AC electric field to irradiate the food with electromagnetic waves at a frequency of 50 kHz. Thus, the interfacial polarization between the water phase and the oil phase can be increased to decrease the interfacial tension between the water phase and the oil phase by approximately 60% and bind water in a pearl-chain structure, thus decreasing the water activity.