

APPLICATIONS OF NON-THERMAL PLASMA TECHNOLOGY FOR FOOD DECONTAMINATION

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Increasing consumer demand for fresh-like convenience foods necessitates an investigation of an emerging antimicrobial technology for the decontamination of food such as plasma technology. Plasma is the fourth state of matter, according to a scale that charts increasing levels of energy, from solid to liquid to gas and finally to plasma. Plasma is made up of a large number of electrons, both positive and negative ions, free radicals, gas atoms, UV photons, and excited or non-excited molecules which in combination are capable of inactivating pathogen and/or spoilage microorganisms including bacteria, mold, yeasts, spores and viruses. Studies have shown that non-thermal plasma technology can be used to inactivate microorganisms on meats, poultry, milk, fruits and vegetables higher than 3 logarithmic units. From the microbiological perspective, non-thermal plasma technology is a promising alternative food technology that could be used for the inactivation of microorganisms; on the other hand, the effect of plasma technology on nutritional value and sensory characteristics of food needs to be investigated as well as the impact of plasma by-products on human health and the environment. This paper reviews the applications of non-thermal plasma technology on food for the inactivation of foodborne pathogens, and examines proposed mechanisms underlying microbial inactivation, while also discussing the limitations of non-thermal plasma technology.

Keywords: Plasma technology, decontamination, non-thermal treatments

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