THE EFFECTS OF ELECTRIC FIELD ON MICROORGANISMS IN SEMI-LIQUID AND LIQUID EDIBLE FOOD SUBSTANCES

In partial fulfillment of the requirements

for the degree of

Bachelor of Science

in Electrical and Electronic Engineering

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DECLARATION

We hereby declare that the thesis titled **"The Effects Of Electric Field On Microorganisms In Semi-Liquid And Liquid Edible Food Substances",** submitted to the Department of Electrical and Electronic Engineering, BRAC University for the fulfillment of degree in Bachelors of Science in Electronics and Electronic Engineering, is our original work. Any information used from other sources has been acknowledged in the reference section.

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ABSTRACT

Pulsed electric field (PEF) is a new, emerging and a non thermal method of processing of food preservation technique, which uses pulsating electric field for the inactivation of microorganisms. The process causes a minimal effect on food quality characteristics such as smell, taste, color and texture. PEF can be especially used for processing liquid and semi-liquid edible food substances. Studies conducted on the energy requirements have concluded that PEF is an energy efficient process compared to the traditional thermal methods such as pasteurization.

In this study the PEF was applied to various edible food items: raw milk, fruit juice, sugarcane extract and tap water. High energy electric field, ranging from 400 V/cm up to 1600 V/cm of frequency 50 Hz was applied and the corresponding microbial colony growth was counted. Here effectiveness of the AC field against the DC field was also compared; the impact of number of pulses applied and effect of thickness of the metal plates on the growth of the microorganisms were studied. The experimental results are encouraging and are supportive of the applied technique.

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