Naruecha Kaewsanay 2009: Lethal Effect of Square Pulse Current on *Bacillus cereus.* Master of Science (Physics), Major Field: Physics, Department of Physics. Thesis Advisor: Associate Professor Bancha Panacharoensawad, Dr. Ing. 68 pages.

The objective of this experiment is to study the lethal effect of *B. cereus* by electric square pulse current at non-lethal effect temperature. The apparatus was designed to suit the experiment. It is composed of three parts, i.e. DC pulse generator, cooling system and treatment chamber.

The *B. cereus* cells in logarithmic phase suspended in nutrient broth (NB) were exposed to electric square pulse current of 110 V duty cycle 50 % at variable electric frequencies (45 Hz, 50 Hz, 55 Hz and 60 Hz) under aerobic conditions. The survival fractions of *B. cereus* cells were related to exposure time. At the temperature 29 ± 3 ºC (non-lethal temperature), the surviving fractions of cells exposed to square pulse current with lower frequency were decreased faster than the cells exposed to square pulse current with higher frequency. It indicated that low frequency electric pulse gave more lethal effect on *B. cereus* than higher frequency electric pulse at the same voltage.

The present investigation shows that the electric square pulse current is an interesting technology to develop for the non-thermal disinfection of liquid foods and it may be a new technology to inactivate the contaminate harmful bacteria.

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