



Mechanism of Inactivation of Food-borne Pathogens by Pulsed Electric Fields

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Food-borne illnesses, especially those caused by the bacterium *E. coli* are a great concern to food processors and consumers alike. Heat is commonly used to eliminate bacteria but it has detrimental effects on food quality and taste. There are several other food preservation methods that have the potential to eliminate bacteria while maintaining higher quality and taste, one of those technologies is called pulsed electric field (PEF).

PEF works by inactivating potentially dangerous organisms by damaging the membranes of their cells using an electric shock.



CHALLENGES

PEF technology has the potential to eliminate bacteria and other dangerous organisms in foods while at the same time preserving quality and taste. In order for this technology to be useful, a method for determining and monitoring cell damage is needed.

ACHIEVEMENTS

OARDC researchers developed a fluorescent-staining technique that rapidly and efficiently measures cell damage during the PEF process. This is the first step toward developing a technology that eliminates dangerous organisms such as *E. coli*, maintains food quality and taste, and is capable of being used by commercial food processors.

THE FUTURE

The industry partner on this project provided an additional \$35,000 toward advancing the PEF technology. With the data obtained in this study and additional funds from the OARDC, an additional \$1,040,404 was secured from the Department of Defense, Dual Use Science and Technology Program allowing the team to further develop both the PEF technology and monitoring techniques.

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