

PULSED ELECTRIC FIELD (PEF) APPLICATIONS IN DAIRY TECHNOLOGY

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Current market conditions and consumer demand in dairy market enforce dairy processing technologies to develop better product quality and reduce energy consumption during processing without compromising product safety. A novel technique called pulsed electric field (PEF) is a promising technology that can be used for this purpose in the near future. Most of the studies focused on the effect of PEF on enzymes and inactivation of pathogenic microorganisms in dairy products showed that PEF does not affect the pathogenic microorganisms in the same way. The latter studies have concluded that structural features (cell membrane etc.) of microorganisms are the important factors to achieve successful inactivation. For industrial applications, design of PEF system gains importance in terms of practical applications. In this area, effect of type of treatment chamber, electric field intensity, number of pulses, inlet temperature of feed, flow dynamics has been researched. However, the idea of using heat generated during PEF treatment to heat inlet raw milk to increase the efficiency of inactivation has been occurred and it is very important in terms of reducing energy consumption. Since being a non-thermal food processing technique, PEF has been gaining importance in dairy industry as well as food industry. This interests researchers and as a result, studies about effect of PEF in not only foods but also dairy products have increased significantly. In this study, principles of PEF, studies that have been done about effect of PEF in dairy products and scale up from lab to industrial scale are reviewed.

Keywords: Pulsed electric field, non-thermal food processing, dairy, food preservation, novel technologies

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