

Title Drying of agricultural products using high electric fields
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Abstract

Purpose of the review: In recent months, the demand to realise an improvement in the quality of agricultural products and more economic processing operations has increased dramatically. The replacement of conventional operations with a number of novel food processing and preservation methods and equipment has gained much attention. This paper focuses on one such relatively new method of non-thermal drying of agricultural products using high electric fields, which shows great potential for industrial application.

Main findings: A range of research utilising electric fields and their pulses to facilitate water removal from agricultural products were found in literature. The technique has the potential either now or in the future to reduce energy consumption in the drying of agricultural products particularly heat sensitive products, with the advantage of quality sustenance during drying. The application of electrohydrodynamic (or high electric field drying) techniques to augment convective mass transfer and the synergism accorded by electrohydrodynamic drying as a pretreatment measure in osmotic dehydration are described.

Directions for future research: Greater efforts need to be made to develop standard dryers based on this technology and to educate the diverse users of agricultural product-drying equipment of the potential benefits of this technique. The present status of high electric field drying (HEFD) technology would benefit from further research to provide better understanding of the underlying physics and ultimate industrial potential. Specific suggestions are made later in this article. Presently, HEFD is a less-developed technology requiring priority due to the worldwide concern about global warming, which is attributed in large measure to greenhouse gases produced by the combustion of fossil fuels.