



The effects of electrical currents on foods and other biological systems

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To extend shelf life of food products a heat treatment is generally required. This may be provided through the use of e.g. tubular heat exchangers or scraped surface devices, where heat is generated outside the food and transmitted to it by conduction and/or convection. For products containing particles, e.g. fruit bits, or for highly viscous fluids, the mentioned heat treatments frequently cause overheating of parts of the product in order to achieve proper heat treatment of the products' *cold spot*. This fatally leads to losses of nutritional as well as organoleptic properties.

In the aseptic processing of these food systems, the application of electric fields (ohmic heating) to the heat treatment of food products is seen has a potential alternative to conventional heating processes, essentially due to the fact that heat is internally generated due to the electrical resistance of foods, thus providing a uniform heating of the product.

Our work has been centred in determining the influence of the application of an electric field on food components (enzymes, other proteins, carbohydrates and lipids) and on microorganisms (both vegetative cells and spores). Further, we have also evaluated the effects of electricity on the performance of fermentation systems, while seeking for other applications (e.g. fostering chemical reaction performance).

The results of our research on these subjects will be presented here.