# Accepted Manuscript


Cold plasma processing of milk and dairy products

Nathalia M. Coutinho, Marcelo R. Silveira, Ramon S. Rocha, Jeremias Moraes, Marcus Vinicius S. Ferreira, Tatiana C. Pimentel, Monica Q. Freitas, Marcia C. Silva, Renata S.L. Raices, C. Senaka Ranadheera, Fábio O. Borges, Simone P. Mathias, Fabiano A.N. Fernandes, Sueli Rodrigues, A.G. Cruz

PII: S0924-2244(17)30687-8

DOI: 10.1016/j.tifs.2018.02.008

Reference: TIFS 2166

To appear in: *Trends in Food Science & Technology*

Received Date: 21 October 2017

Revised Date: 3 February 2018

Accepted Date: 5 February 2018

Please cite this article as: Coutinho, N.M., Silveira, M.R., Rocha, R.S., Moraes, J., Ferreira, M.V.S., Pimentel, T.C., Freitas, M.Q., Silva, M.C., Raices, R.S.L., Ranadheera, C.S., Borges, F.O., Mathias, S.P., Fernandes, F.A.N., Rodrigues, S., Cruz, A.G., Cold plasma processing of milk and dairy products, *Trends in Food Science & Technology* (2018), doi: 10.1016/j.tifs.2018.02.008.

**Abstract**

**Background:** Thermal pasteurization and sterilization are predominantly used in the dairy industry due to their efficacy in improving the product safety and shelf life. However, heat treatment can cause undesirable protein denaturation, non-enzymatic browning, loss of vitamins and volatile flavor compounds, freezing point depression, and flavour changes. Cold plasma is a non-thermal technology that has gained attention in recent years as a potential alternative method for chemical and thermal disinfection in foods using ambient or moderate temperatures and short treatment times.

**Scope and approach:** This review aims to describe the fundamentals, parameters, and technology on cold plasma, discussing the critical processing factors involved in this technology. Also, it describes the mechanisms of microbial inactivation and provides an overview of the effects of non-thermal plasma on the quality of dairy products, considering a physicochemical, sensory and microbiology perspective.

**Key findings and conclusions:** Cold plasma uses less aggressive mechanisms of action to the milk matrix when compared to the techniques currently used, and has shown an excellent performance on the elimination of pathogenic and spoilage microorganisms besides maintaining, in many cases, the nutritional, functional, and sensory characteristics of the product.

**Keywords:** emerging technologies; cold plasma; dairy foods; processing; microbial; food safety.