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Cold plasma processing of milk and dairy products

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1 **Abstract**

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

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

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

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

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