

Innovative thermal and non-thermal treatments for microorganism inactivation in plant milk

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Abstract

The growing popularity of plant-based diets can be connected to the quick global expansion of plant-based dairy products. This review examines the classification of plant milk's fundamental components and outlines the principal processing stages involved in their manufacture. Particular attention is given to the influence of processing operations on product quality, stability, and safety. Microbial inactivation, a critical step in plant milk processing, is discussed alongside the conventional and emerging technologies used for this purpose. Current approaches include thermal methods and innovative technologies such as ohmic heating, microwave processing, high-pressure processing, ultrasonication, pulsed electric field treatment, and ultraviolet irradiation. The available literature indicates that these technologies can effectively improve microbiological safety while upholding sensory and nutritional qualities. Consumption of high-nutrient, plant-derived milk is anticipated to rise as new technologies develop globally, leading to the emergence of several plant-milk product categories.

Keywords: Microbial Inactivation; Milk Alternatives; Non-Thermal Processing; Plant Based Milk; Thermal Processing