

POSSIBLE APPLICATIONS OF HIGH-PRESSURE PROCESSING OF MILK AND DAIRY PRODUCTS

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Abstract

The processes of pasteurization and sterilization have been known to exert an adverse effect on milk components with an ultimate negative effect on its composition and properties. In view of the above, technologies avoiding heat treatment are increasingly used in the dairy industry. Compared to traditional heat treatment regimes, high pressure processing (HPP) is a cold treatment that is conducted at room or very low temperature, therefore it does not have an adverse effect on the product, which is fresher and has better appearance and texture. Given the above facts, the aim of this review is to summarize the most common applications of HPP in the manufacture of milk and dairy products, as well as to outline future possibilities for its implementation.

The current state of the high pressure processing application in dairy industry and its effect on milk constituents, microorganisms and milk coagulation enzymes were discussed. It was reviewed the possible applications of HPP treatment in dairy industry: in the manufacturing of pasteurized milk, of yogurt, of dairy beverages, in cheese manufacturing, in the manufacturing of ice cream, of baby formulas and other applications. Recent studies showed that the minimum HPP parameters required for extending the shelf life of skimmed milk were 400 MPa/15 min, the destruction of pathogenic microflora occurs at a pressure of 400 - 600 MPa, and complete inactivation of microorganisms takes place at pressures above 800 MPa. HPP can be effective in reducing the cost of using large amounts of milk coagulation enzymes in cheese manufacture. Suppression of putrefactive microflora and inactivation of pathogenic microorganisms with minimal changes in the sensory properties opens a wide range of opportunities for dairy producers employing this technology.

High-pressure processing often manifests a positive effect on product quality compared to traditionally applied heat treatment. The most commonly applied pressures are between 250 and 600 MPa. HPP is potentially applicable for all types of dairy products: to improve quality characteristics (organoleptic, physicochemical and microbiological); to improve functionality; to extend shelf life.

Key words: *High-pressure processing, Dairy products, Milk, Milk components.*