

High pressure processing in food and beverage industry

■ SREENATH PILLAI AND LEENA MURALIDHARAN

SUMMARY : Consumers demand high quality and convenient products with natural flavor and taste, and greatly appreciate the fresh appearance of minimally processed food. In order to harmonize or blend all these demands without compromising the safety of the products, it is necessary to implement newer preservation technologies in the food industry. High pressure processing kills microorganisms and preserves food” was discovered way back in 1899 has been used with success in chemical, ceramic. Hite (1899) investigated the application of high pressure as a means of preserving milk, and later extended the study to preserve fruits and vegetables. The ability of high pressure to inactivate microorganisms and spoilage catalyzing enzymes, whilst retaining other quality attributes, has encouraged Japanese and American food companies to introduce high pressure processed foods in the market. High pressure is required to produce the packaged foods that are safer, longer lasting, more natural and better tasting. In addition, high pressure processing (also called high pressure pasteurization) provides the food industry with new product development opportunities that can fully exploit the functional properties of ingredients such as proteins, etc. Pressure is applied uniformly throughout a food material, independent of its mass and time. HPP is a method of food processing where food is subjected to elevated pressures (87,000 pounds per square inch or approximately 6,000 atm), with or without the addition of heat, to achieve microbial inactivation or to alter the food attributes in order to achieve consumer-desired qualities. Pressure inactivates most vegetative bacteria at pressures above 60,000 pounds per square inch. HPP retains food quality, maintains natural freshness, and extends microbiological shelf life.

Key Words : HPP, Food and beverage industry, Natural food, Pure food, Long lasting food

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In the last decade of 20th century, high pressure science and technique have found application in new areas of biology, biochemistry and production of novel foods. Consumer demands for high quality foods fresh in taste and high in nutritive value have created considerable interest in the development of new food-processing techniques. Such techniques primarily involve the ability of high pressure to inactivate microorganisms and spoilage catalyzing enzymes,

whilst retaining other quality attributes. In addition, high pressure processing provides the food industry with new product development opportunities that can fully exploit the functional properties of ingredients such as hydrocolloids, proteins, etc.

High- pressure treatment of foods involves subjecting food materials to pressures as high as 9000 times the atmospheric pressure. Pressure is applied uniformly throughout a food material, independent of its mass and time. Use of high pressure in food processing is an extension of a technology that is commonly employed in many other industrial processes since the early 1990s. The effects of high pressure in inactivating microorganisms have been known for more than a century.

These early studies demonstrated that application of high pressure had effects similar to the use of high temperature on proteins and microbial population in foods.

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