International Food & Meat Topics

Foodsafety BYTES

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High-pressure processing

We process food to improve quality and to extend shelf life. But there is a fine line between removing pathogens and maintaining the nutritional value and the structural integrity of foods. Food processing methods that involve heat can kill spoilage bacteria, but they can also affect things like the texture of foods, their nutrient value, as well as vitamins and fibre content. This is where high-pressure processing comes in, to ensure food safety without changing the integrity of foods.

What is High-pressure processing (HPP)?

High-pressure processing is a non-thermal food preservation method that deactivates spoilage micro-organisms and reduces levels of foodborne pathogens by using cold water and intense pressure instead of heat. This process not only has minimal effects on taste, texture and nutritional content but also maintains the original appearance of the foods while promoting food safety and increasing shelf life.

High-pressure processing can be used at various stages in the food chain. It can be applied to raw foods such as milk but also to processed foods such as pre-packed cooked meats and ready-to-eat meals.

HPP Technology

HPP systems usually consist of a pressure chamber, a loading system including loading trays, high pressure pumps, a water circuit and a control system. The food products (liquid or solid foods, with or without packaging) are placed in the loading tray which is inserted into the pressure chamber. The chamber is sealed and filled with water.

The food products are exposed to pressures ranging between 100-800MPa for differing lengths of time depending on the purpose of pressure treatment. The process temperatures during pressure treatment can be set to below 0°C and to above 100°C. The exposure times at selected pressures can be between a millisecond to more than 20 minutes. After the treatment time has finished, the pressure chamber is depressurised and emptied, and the loading tray withdrawn from the chamber.

HPP acts instantaneously and uniformly independent of size, shape and composition. Therefore size, shape and composition are not factors when determining the process.