

International Conference on

Food Chemistry & Hydrocolloids

August 11-12, 2016 Toronto, Canada

The potential use of ultra-high pressure homogenization process for milk treatment

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Ultra-High Pressure Homogenization (UHPH) technology has been applied in milk as an alternative to heat treatment. It is based on the traditional homogenization applied in dairy industry, but with improvements in seat valve material, which help to reach pressures up to 350 MPa. The main parameters in UHPH process are the operating pressure (100 to 350 MPa), inlet temperature and the number of passes (which is a reinsertion of the product in to the equipment). As a part of the pressure increase in the homogenization valve, there is an increment in fluid temperature. This temperature increase has an important effect on the changes observed in the food matrix. The UHPH application in milk has raised interest because it can reduce the number of industrial processes, from homogenization and pasteurization separated into one process at once. In this sense, the technology has proved to eliminate microorganisms by mechanical mechanisms (cavitation, high speed collisions and shear stress) which increase by pressure, Ti and number of passes increment. Further, an adequate combination of pressure and Ti has proved to be effective to achieve a product with similar shelf life to pasteurized milk and as well eliminate spore in sufficient numbers to obtain sterile milk. Other important changes evaluated as a consequence of the use of the UHPH process in milk are the modification of the fat globule, micelle size, mineral balance, enzymes inactivation, less cooked off-flavor and minor changes in vitamin content, showing the possibility of employing this technology as a heat treatment substitute.

Biography

Genaro G Amador Espejo recently completed his PhD from Universidad de las Americas Puebla, Mexico in Food Science, with the specialty in Dairy Products. As a part of his Doctoral project, he participated in an international project funded by the European Union at the Universitat Autònoma de Barcelona. Further, he has participated in many national and international research meetings and scientific publications regarding application of non-thermal technologies in milk. His interest in food science and food preservation started during his work in several research projects applying emerging technologies.

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