

Poster

Development and Optimization of a Continuous Ultra High Pressure Homogeniser for Application on Milks and Vegetable Milks

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With the purpose of increasing the competitiveness of the SME as well as obtaining safe foods without losses of nutritional value, this project was aimed to develop and optimize a continuous Ultra High Pressure Homogeniser (UHPH), for application on milks and vegetable milks. This machine is capable of applying pressures of up to 400 MPa, using a special homogenising system which allows the elimination of microbes while maintaining the nutritional value, and combines this with the development of a system to control the treatment temperature (30-150 °C). This system could substitute HTST pasteurisation and UHT sterilisation with less energy consumption and less contamination.

The work focused on the development of dairy products (pasteurised milk, sterilised milk, fresh and ripened cheese and yogurt from UHPH treated milk and whey protein concentrates), and vegetable milks (lupine, soya and almond milks). Research was carried out to ensure the safety of the process (killing of pathogenic micro-organisms, absence of toxic and carcinogenic substances).

Five SMEs, three Universities and two Research Centres were participating in this project creating a multidisciplinary team.

The first part of the work was the design and development of the machine, and its adaptation to the food industry (connections, cleaning procedures, etc.). This machine is connected to an aseptic tank, which is connected to an aseptic packaging machine (Tetra Pak), to fully simulate industrial production.

The second part was the application of UHPH treatment to milks and vegetable milks for drinking (pasteurised and sterilised milks), or for making cheese, yogurt and desserts, and also protein concentrates for additive applications. The effect of UHPH on these foods was studied: functionality, nutritional characteristics, microbial inactivation and the possibility of the generation of toxic compounds.

Finally, several different studies were conducted to evaluate consumers' acceptance and attitudes towards the products treated by UHPH and towards the process itself. The exploitation of the technology and developed products were investigated.