Ultrasound applications for more efficient food processes

SILVA F. (1), SULAIMAN A. (2)
1 LEAF, Agronomy School, University of Lisbon, Portugal, Lisboa, Portugal
2 Universiti Putra Malaysia, Selangor, Malaysia

Ultrasound has been used in a variety of food processing procedures, both for research and commercial applications. This technology has generated considerable interest due to its environmental friendliness, improved throughput, lower prices, streamlined operations, and better final product quality. Ultrasound is composed of sonic waves with frequencies higher than human ear audible sound. Power ultrasound uses lower frequencies than medical applications. The sonication generates bubbles in the liquid food as the wave energy propagates, a phenomenon known as acoustic cavitation. The ultrasound unit consists of a generator which converts electricity into high frequency alternating current and a transducer for converting the current into mechanical vibrations. The main objective of this study was to review the most recent ultrasonic assisted food processing applications and equipments. The design of ultrasound systems for liquid foods cavitation included beverages pasteurisation, filtration, liquid extraction, foaming, and defoaming unit operations. Ultrasound configurations for cutting, freezing, drying, and brining/pickling of solid food processes were also covered.
Funding: FCT – Fundação para a Ciência e a Tecnologia, I.P., under the project UIDB/04129/2020 of LEAF-Linking Landscape, Environment, Agriculture and Food, Research Unit.