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Combined machines by using ultrasounds, microwave and heat exchanger to improve the olive paste conditioning: Impact on olive oil quality and yield

In this paper an industrial combined plant assembled by a low frequency ultrasound device, a microwave apparatus and a heat exchanger were employed and implemented in an industrial olive oil plant to improve the conditioning of the olive paste. Four different conditioning conditions were compared to the traditional one. The extractability index (E), rheological parameters and olive oil quality were determined. The use of only the heat exchanger for the conditioning of the olive paste leads to a low value of extractability. By placing in series the heat exchanger and the traditional malaxed, it is possible to obtain the same quantitative performances, reducing the conditioning time from 40 min to 20 min. By using a microwave system in series with a heat exchanger, it is possible to reduce the conditioning time considerably to just 4 min, obtaining an entirely continuous process. Combining heat exchanger, microwave, ultrasound an

slight increase of extractability was found. Finally the use of alternative conditioning technologies, alone or in combination, are able to save the lipophilic antioxidant furniture while, on the contrary, brought to a reduction of hydrophilic antioxidant. The cavitation effect of ultrasound is able to overcome this drawback

Speaker Biography

Alessandro Leone is an Associate Professor in agricultural mechanics and food processing plants, SAFE department, engineering area, University of Foggia, where he teaches mechanics and mechanization in agricultural, food engineering and work safety. His major research topics are, in food processing plants: agro-food industry plants and process settings, processing logic control, recovery of agro-food waste by-products to useful composts in agriculture, as well as waste management and in agricultural mechanics: Analysis of the vibrations transmission mode from the vibrating heads to the trunk of olive trees and subsequent optimization; study, design of mobile elevating work platforms; safety devices on tractors and machinery.

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