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Effective clarification of pomegranate juice: Introducing a pre-clarification step prior to ultrafiltration

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The aim of this study was to evaluate the feasibility of implementation of a pre-clarification step in order to improve the performance of subsequent ultrafiltration (UF) treatment. The effects of pre-clarification with combined or standalone use of fining agents such as gelatin, bentonite and polyvinyl polypyrrolidone (PVPP) on UF performance were evaluated through an analysis of flux behavior. The membrane, fouling and cake layer resistances, their contribution to the total resistance, were also analyzed through the evaluation of the hydraulic permeability of the membrane measured before and after the treatment with PJ and cleaning procedures. The cake layer resistance contributed 54.9% of the total resistance for UF of raw juice, confirming that the cake layer formation on the membrane surface was the major cause of flux drop occurred immediately at the beginning of the UF process. The results have clearly shown that performance of the ultrafiltration system was significantly improved by using a pre-clarification step utilizing fining agents of up to 10 fold lesser amounts in comparison with conventional applications. The ratio of cake layer resistance to total resistance decreased to 35% - 48.2% depending upon the pre-clarification process applied prior to UF. According to both the flux behavior and the resistance data, sequential application of PVPP and bentonite was considered to be the best pre clarification treatment for enhancement of flux behavior during ultrafiltration.

Biography

Pelin Onsekizoglu Bagci has completed her PhD on November 2010 from Department of Food Engineering, Hacettepe University, Turkey. She is an Assistant Professor at Trakya University, Department of Food Engineering. She has been granted a fellowship by The Scientific and Technological Research Council of Turkey and has been working as a postdoctoral researcher University of Wisconsin Biological System Engineering since December 2013. Her primary research goals are directed toward analysis of the potentialities of membrane contactors and integration of membrane operations for processing fruit juices under mild conditions. She has involved in several national funded research projects and has authored several papers on international peer-reviewed scientific journals.

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