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APPLICATIONS OF MEMBRANE TECHNOLOGIES FOR TODAY AND TOMORROW

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ABSTRACT Traditionally, in the food industry, microfiltration (MF) and ultrafiltration (UF) were mainly used for concentration, purification and/or recovery of product from aqueous solutions while electrodialysis (ED) was used for demineralization. There is now a new key driver for the development of new membrane technologies applications: consumers want foods that provide beneficial effects for their health. As a result, several researches in the field focus on: (1) the removal of antinutritional factors from food ingredients or the isolation of bioactives compounds, in order to make them available in the form of new "health" ingredients, or (2) the stabilization/protection of bioactive compounds. In this presentation, a few recent applications of membrane technologies will be discussed including: (1) the removal of phytic acid from plant protein isolates by combining electrodialysis with bipolar membranes (EDBM) and UF. Briefly, phytic acid/protein ratio in the protein isolate is decreased by as much as 50%, when compared to the ratio observed in the isolate produced by acidic precipitation, and in addition the solubility is improved by as high as 25 % for the pH range 2-4.5; (2) the stabilization of polyphenols present in opalescent apple juice by combining EDBM for acidification of the juice to pH 2.0 with a mild heat treatment at 45°C. The PPO enzyme (responsible for enzymatic browning reaction) is inactivated in only 5 minutes, and the treatment did not induce cooked apple aftertaste. The result is a clear and stable juice with a high content of polyphenols.

Keywords: Electrodialysis, Microfiltration, Ultrafiltration.