Recovery of Polyphenols, Tocopherols and Sterols from Rapeseed Deodorizer Distillate

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During physical refining of high temperature-short time pretreated rapeseeds, polyphenols are separated from the oil during deodorization and accumulate together with other high-value minor compounds as well as major compounds of low value in the so-called deodorizer distillate (DD).

The main polyphenolic compound contained in DD was characterized to be a dimer of vinylsyringol, a derivative of sinapic acid. This newly-discovered compound that is also contained in a lower extent in physically refined oil was found to have favorable antioxidative properties similar to a physiological mixture of α/γ-tocopherol. To provide the basis for the application of the vinylsyringol-dimer as an additive for the food industry organoleptic as well as toxicological properties were investigated.

For the recovery of the valuable compounds from the deodorizer distillate, a separation process involving the separation operations of short-path distillation, supercritical extraction with CO_2 and ambient pressure solvent extraction as well as crystallization is proposed.

Applying these separation operations, fractions enriched in polyphenols, tocopherols and sterols have been obtained in a total yield of about 50% in relation to the initial content of the deodorizer distillate.