

Removal of Phospholipids from Crude Corn Oil by Enzymatic Degumming Process

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Degumming is the first step of edible oil refining process and it is particularly applied for removal of phospholipids from crude oils. Acid degumming is a widely used process, however, nowadays enzymatic degumming studies gain increasing importance. In this study, enzymatic method was applied to crude corn oil. The effect of reaction parameters on this process was investigated and the proper reaction conditions were established to lower the phosphorus content of oil less than 10 ppm. EnzyMax, Enzymatic method, in which all reactants are added at the same time at reaction temperature, and traditional acidic method were applied to crude corn oil having phosphorus content of 495 ppm. By acidic method, phosphorus content of product was measured as 55 ppm after 2 h and remained nearly constant at this value. Studies are continued with enzymatic methods using a microbial Lecitase® Ultra A₁ enzyme. Crude corn oil was separately treated with same amount of enzyme according to EnzyMax and Enzymatic method working conditions. The phosphorus contents of the oils obtained from both processes were found to be almost the same value. Enzymatic method is selected for suitable process because of being an easier method and having cost advantages than EnzyMax method which includes pretreatment stage. For enzymatic method, the appropriate temperature, pH, enzyme and water amounts per 75 g of oil, and time were determined 50 °C, pH 5, 50 µL and 1.5 mL, and 2 h, respectively. At these conditions, phosphorus content of oil was determined as 4.8 ppm.