

**ABSTRACT:**

Combined degumming and bleaching is the first stage of processing in a modern physical refining plant. In the current practice, the amount of phosphoric acid (degumming agent) and bleaching earth (bleaching agent) added during this process is usually fixed within a certain range. There is no system that can estimate the right amount of chemicals to be added in accordance with the quality of crude palm oil (CPO) used. The use of an Artificial Neural Network (ANN) for an improved operating procedure was explored in this process. A feed forward neural network was designed using a back-propagation training algorithm. The optimum network for the response factor of phosphoric acid and bleaching earth dosages prediction were selected from topologies with the smallest validation error. Comparisons of ANN predicted results with industrial practice were made. It is proven in this study that ANN can be effectively used to determine the phosphoric acid and bleaching earth dosages for the combined degumming and bleaching process. In fact, ANN gives much more precise required dosages depending on the quality of the CPO used as feedstock. Therefore, the combined degumming and bleaching process can be further optimised with savings in cost and time through the use of ANN.