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## Protein recovery from potato processing water using ultrafiltration (UF) membrane

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Wastewater effluent from potato processing industry is highly polluted. Costly treatment systems are required to decrease the high BOD and COD of this water which are due to valuable contents such as starch, protein and vitamins. The expenses of wastewater treatment can be reduced if these valuable contents are recovered. Potato protein has been recovered from potato fruit juice (PFJ) in some previous studies using different technologies including membrane. It has been shown that ion-exchange on carboxymethyl cellulose and some of the traditional methods for protein recovery, like concentration, precipitation and heat coagulation have not been successful in recovering high yield of high quality and functionality protein. Denaturation during the recovery process, low re-solubility, acidic pH, poor quality and functionality are known as the reasons that prevent the recovered protein to be used in human food but it has been used as kettle feed. Ion-exchange using expanded bed adsorption (EBA) was successful to recover high yield of high quality and un-denatured potato protein but it is complex and expensive. Membrane ultrafiltration (UF) technology also achieved high yield of potato protein recovery as reported in the literature but it has not been commercialized due to membrane fouling issues while the technology has been widely used in food industry. In the current research work, potato protein recovery from potato processing water (PPW) was approached by using UF membrane with the focus on fouling minimization through pre-treatment strategies. The quality and functionality of the recovered protein was the assessed and the process and product improvement was approached through the study of dead-end and cross flow configuration with diafiltration stage added to the original process to increase the purity. A pilot scale rig was designed and built based on the experimental parameters to validate the process for commercial scale.

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