

Concentration of protein in fish mince wash water discharged from Surimi processing plant by ultrafiltration

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ABSTRACT

Fish mince wash water, discharged from a Surimi processing plant, has a major impact on wastewater treatment. It contains some valuable components such as proteins and enzymes. Therefore, recovery of these components is not only done to reduce environmental pollution but also to gain valuable components. In this work, protein in fish mince wash water was recovered and concentrated by ultrafiltration. The experiments were carried out using plate and frame regenerate cellulose membrane with a molecular weight cut off (MWCO) of 30 and 100 kDa, and the effect of MWCO and operating conditions on permeate flux and protein retention was investigated. It was found that protein retention was about 98% for both membranes while the crossflow rate and transmembrane pressure (TMP) did not affect protein rejection. The permeate flux at the same TMP of the 30 kDa membrane was higher than that of the 100 kDa membrane. Therefore, the 30 kDa membrane was used for the concentration of protein. It was also found that protein in fish mince wash water (0.27±0.08% (w/v)) could be concentrated up to 10.92±0.08% (w/v) at a volume concentration factor (VCF) of 40 and about 84% of chemical oxygen demand (COD) was reduced. In addition, the empirical equation based on a shear controlled model was developed to describe permeate flux during batch concentration.

Keywords: Fish mince; Protein concentration; Shear controlled model; Ultrafiltration

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