# Poultry Slaughterhouse Wastewater Treatment with Membrane Technologies

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Poultry slaughterhouses produce a large amount of wastewater, which is usually treated by conventional methods. The traditional techniques face some challenges, especially the incapability of recovering valuable nutrients and reusing the treated water. Therefore, membrane technology has been widely adopted by researchers due to its enormous advantages over conventional methods. Pressure-driven membranes, such as microfiltration (MF), ultrafiltration (UF), nanofiltration (NF), and reverse osmosis (RO), have been studied to purify poultry slaughterhouse wastewater (PSWW) as a standalone process or an integrated process with other procedures. Besides pressure-driven membrane, the forward osmosis (FO) membrane is also used for wastewater treatment. To address these challenges of food security and sustainability of the poultry processing industry, a sequential membrane process of (UF-FO) is used in our research to treat semi-processed slaughterhouse wastewater and recover the water and valuable nutrients. The pretreatment of PSWW with UF removed 36.7% of chemical oxygen demand (COD), 38.9% of total phosphorous (TP), 24.7% of total solids (TS), 14.5 % of total volatile solids (TVS), and 27.3 % of total fixed solids (TFS). The FO process thoroughly removed 100% of COD and TP. Moreover, the FO membrane flux was restored to almost 100 % by flushing the membrane with 0.1% Sodium Dodecyl Sulfate solution. The sequential membrane process of (UF-FO) showed excellent performance by providing high efficiency for pollutant removal and the recovery of water and valuable products. It removed most of the pollutants from PSWW and produced water that can be discharged to the environment, or can be reused for industrial poultry processing purposes.