

Treatment of Poultry Slaughterhouse Wastewater by Mesophilic Static Granular Bed Reactor (SGBR) Coupled with UF Membrane

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Abstract : In South Africa, Poultry slaughterhouses consume largest amount of freshwater and discharges high strength wastewater, which can be treated successfully at low cost using anaerobic digesters. In this study, the performance of bench-scale mesophilic Static Granular Bed Reactor (SGBR) containing fully anaerobic granules coupled with ultra-filtration (UF) membrane as a post-treatment for poultry slaughterhouse wastewater was investigated. The poultry slaughterhouse was characterized by chemical oxygen demand (COD) range between 2000 and 6000 mg/l, average biological oxygen demand (BOD) of 2375 mg/l and average fats, oil and grease (FOG) of 554 mg/l. A continuous SGBR anaerobic reactor was operated for 6 weeks at different hydraulic retention time (HRT) and an Organic loading rate. The results showed an average COD removal was greater than 90% for both the SGBR anaerobic digester and ultrafiltration membrane. The total suspended solids and fats oil and grease (FOG) removal was greater than 95%. The SGBR reactor coupled with UF membrane showed a greater potential to treat poultry slaughterhouse wastewater.

Keywords : chemical oxygen demand, poultry slaughterhouse wastewater, static granular bed reactor, ultrafiltration, wastewater

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020