

A Combined Activated Sludge-Filtration-Ozonation Process for Abattoir Wastewater Treatment

Authors : Pello Alfonso-Muniozguren, Madeleine Bussemaker, Ralph Chadeesingh, Caryn Jones, David Oakley, Judy Lee, Devendra Saroj

Abstract : Current industrialized livestock agriculture is growing every year leading to an increase in the generation of wastewater that varies considerably in terms of organic content and microbial population. Therefore, suitable wastewater treatment methods are required to ensure the wastewater quality meet regulations before discharge. In the present study, a combined lab scale activated sludge-filtration-ozonation system was used to treat a pre-treated abattoir wastewater. A hydraulic retention time of 24 hours and a solid retention time of 13 days were used for the activated sludge process, followed by a filtration step (4-7 μm) and using ozone as tertiary treatment. An average reduction of 93% and 98% was achieved for Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD), respectively, obtaining final values of 128 mg/L COD and 12 mg/L BOD. For the Total Suspended Solids (TSS), the average reduction increased to 99% in the same system, reducing the final value down to 3 mg/L. Additionally, 98% reduction in Phosphorus (P) and a complete inactivation of Total Coliforms (TC) was obtained after 17 min ozonation time. For Total Viable Counts (TVC), a drastic reduction was observed with 30 min ozonation time (6 log inactivation) at an ozone dose of 71 mg O₃/L. Overall, the combined process was sufficient to meet discharge requirements without further treatment for the measured parameters (COD, BOD, TSS, P, TC, and TVC).

Keywords : abattoir waste water, activated sludge, ozone, waste water treatment

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