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Ciro Fernando Bustillo-Lecompte, Mehrab Mehrvar



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Treatment of actual slaughterhouse wastewater by combined anaerobic–aerobic processes for biogas generation and removal of organics and nutrients: an optimization study towards a cleaner production in the meat processing industry

Ciro Fernando Bustillo-Lecompte ^a, Mehrab Mehrvar ^{b*}

^a *Graduate Programs in Environmental Applied Science and Management, Ryerson University, 350 Victoria Street, Toronto, ON, Canada, M5B 2K3*

^b *Department of Chemical Engineering, Ryerson University, 350 Victoria Street, Toronto, ON, Canada M5B 2K3*

ABSTRACT

Environmental protection initiatives and the increasing market demands for green practices are driving the meat processing industry to consider sustainable methods for wastewater treatment since slaughterhouse wastewater (SWW) is seen as detrimental worldwide. Thus, on-site treatment is the preferred option to treat the slaughterhouse effluents for water reuse and potential energy recovery due to the conversion of organics into biogas. The treatment of an actual SWW is studied in a combined biological system. An anaerobic baffled reactor (ABR) followed by an aerobic activated sludge (AS) reactor are used in continuous mode at laboratory scale. Response surface methodology (RSM) is used for the process optimization to maximize biogas yield and to remove the total organic carbon (TOC) and total nitrogen (TN) while minimizing the total suspended solids (TSS) residuals. The effects of the flow rate, the pH, the influent TOC concentration, and their interactions on the overall treatment efficiency as well as

* Corresponding author. Tel.: +1 (416) 979-5000 Extension 6555, Fax: +1 (416) 979-5083
E-mail: mmehrvar@ryerson.ca (M. Mehrvar)

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