



EFFECT OF INOCULUM AND SUBSTRATUM ON COD REMOVAL OF SLAUGHTERHOUSE WASTEWATER

Gilberto Gallardo, Jose A. Rodriguez, Iveth D. Antonio, Silvia Y. Martinez

^aDepartamento de Botánica, Universidad Autónoma Agraria Antonio Narro, Saltillo, Coahuila, CP 25315

^bDepartamento de Biotecnología, Universidad Autónoma de Coahuila, Saltillo, Coahuila, CP 25280

E-mail: silvia.martinez@uaaan.mx

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Introduction. There are 1151 slaughterhouses in Mexico (1). In these slaughters is needed 20 to 1000 liter of water depending of animal size (2). Anaerobic digestion in high-rate reactors represents an attractive alternative for wastewater treatment at the slaughterhouse plant. First, slaughterhouse wastewater is particularly well suited for anaerobic treatment. It contains high concentrations of biodegradable organics, mostly from fats and proteins, sufficient alkalinity, and adequate phosphorous, nitrogen, and micronutrient concentrations for bacterial growth (3,4). The slaughterhouse wastewater used in this work was recollected in Municipal Slaughterhouse TIF 377. The purposes were evaluating two granular sludges as inoculum and the effect of substratum (polyurethane foam).

Methods.

The aim of the present study was use two different types of inoculums and evaluate the addition of polyurethane foam (PF) as substratum for fixation. The first part of the work was carried out in batch reactors. Inoculums were collected from different locations, from a brewery wastewater treatment plant (BWP) and from an anaerobic lagoon located on UAAAN (UAAAN). The reactors were divided in four treatments: BWP, BWP+PF, UAAAN, UAAAN+PF. The second part was carried out in biofilms system reactor (packed with UAAAN sludge and PF) with an HRT of 1 day. All the experiments were to carried out at 16 to 20°C. The slaughterhouse wastewater used in this study contained 6 to 10 g/l of COD. The pH of wastewater was 7 to 7.6

Results. In the figure 1 is appreciate COD consumption in batch reactors. The UAAAN and UAAAN+PF systems achieved higher COD removal (80%) than BWP and BWP+PF (40%). It was observed that inoculum had effect in COD consumption but not the substratum. In the start-up of biofilm system reactor (recirculation conditions), was obtained a 80% of COD removal efficiency in 12 days at HRT of 1 day (see fig. 2). Decrease of pH was not detected for any UAAAN system, it remain approximately at 7.5. In BP systems the pH decreased until 6.0. These results suggest that the microorganisms of inoculum UAAAN are able to buffer the pH, in such a way the COD removal was continuous.

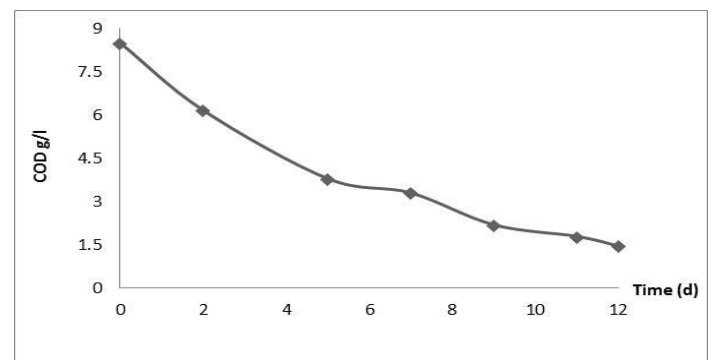
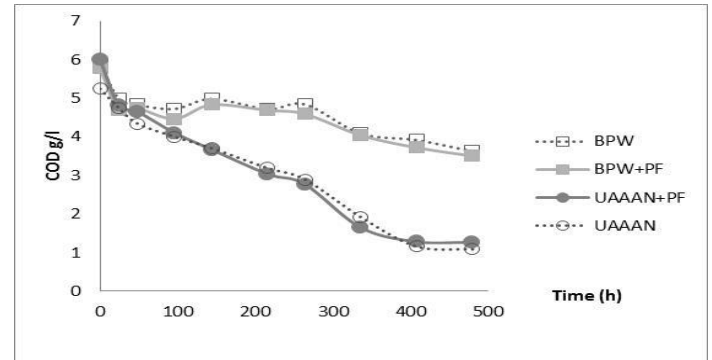


Fig.2 COD consumption in biofilm system at HRT of 1 day in recirculation conditions.

Conclusions. The inoculum had an effect on the COD removal of slaughterhouse wastewater. In batch and continuous systems was achieved 80% of COD removal efficiency using UAAAN inoculum.

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Fig.1 Effect of inoculum and substratum on COD consumption in batch reactors.