Wellcome

On behalf of the organizing committee and of the Mexican Association of Food Science and Food Biotechnology in Developing Countries (AMECA), we give you the warmest welcome to our bi-annual event, the "Fourth Congress on Food Science and Food Biotechnology in Developing Countries". This meeting is taking place from November 29 to December 01, 2010, at the World Trade Center of Boca del Río, Veracruz, México. The goal of this international scientific event is to gather experts from the academia, industry and government working in nine areas of Food Science and Food Biotechnology, such as Nutrition, Sensory Evaluation, Postharvest, Food Engineering, Food Biotechnology, Emerging Technologies, and Nanotechnology. These specialists will be presenting and discussing with delegates recent advances in research and technological developments generated in Mexico as well as in other participant countries including Spain, France, Canada, United States of America, Brazil, and Chile.

We wish that during your stay in Veracruz you may enjoy the scientific and social programs that we have carefully prepared for all delegates within the framework of this magnificent event. You may also enjoy the traditional hospitality and natural beauty which is always offered by Veracruz and its surrounding area.

Prof. Beatriz Torrestiana Sánchez
President of the Congress

Prof. Carlos Regalado González
President of AMECA

A Comparison of the Effect of Salinity on Thermophilic and Mesophilic Anaerobic Digestion

Sánchez-Olguín, G.; Forster, C.

* Instituto de Ciencias Agropecuarias, Universidad Autónoma del Estado de Hidalgo; Av Universidad Km. 1, Rancho Universitario, Tulancingo Hgo., México
* e-mail: abys21@yahoo.com

This report aims to attain find out a different performance between mesophilic and thermophilic reactors in order to compare its particular sensibility under salinity conditions. Salinity effects were evaluated by COD efficiency test, biogas characterization (GC gas chromatography), methane production and methane yield determination. Chloride inhibition over bacteria activities, reduces the effectiveness of COD removal, in wastes treatments. Mesophilic and thermophilic reactors installed as a lab-scale bench, at The University of Birmingham in Civil Engineering School laboratory, were fed continuously with a feed based on waste from Cardbury´s with strength of 1700+/-200 mg/l COD and mineral salts. System was operated at a hydraulic retention time of 18 hrs, achieved by a flow rate 0.084 l/h. Reactors were run and monitored first with salinity of zero and followed by salinity increasing ranges such as 0.75, 2.5, 5 and 10 g/l chloride ion content. Mesophilic reactor indicated higher COD removal effectiveness than that thermophilic: 70% and 45% respectively. Thermophilic reactor had a better methane production than that mesophilic: 0.65 l/d and 0.55 l/d respectively. Consequently, methane yield within about 0.3 m^3 methane/kg COD removed and 0.75 m^3 methane/kg COD removed were obtained from mesophilic and thermophilic reactors respectively. Performance difference was significant: ANOVA: $F_{0.05,1,12}$=4.75; $F0_{CODr}$=38.71; $F0_{MProd}$=12.17; $F0_{MYield}$=16.24. Salinity has a high effect on methane production, basically at the last salinity period of 10 g/l Cl^-, where the whole system got stress on their sensibility, but difference was not significant: ANOVA: $F_{0.05,1,8}$=5,32; $F0_{Mesoph}$=4.06; $F0_{Thermoph}$=1.47. Salinity does not have a substantial effect on COD removal. Thermophiles sensibility got stress with high salinities (5 g/l as Cl^-), but they recovered immediately their performance. Bacterial viability reflects stress response under salinity conditions, but bacteria culture shown early to be used to a new conditions. Halide bacteria culture and two phase configuration should be considered for future research under salinity higher than 10 g/l Cl^-.

Keywords: Anaerobic digestion, biogas, methane production, COD removal, salinity.