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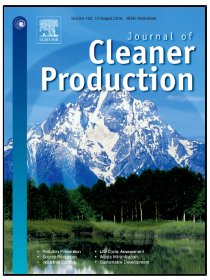

Food waste anaerobic digestion of a popular restaurant in Southern Brazil

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FOOD WASTE ANAEROBIC DIGESTION OF A POPULAR RESTAURANT IN SOUTHERN BRAZIL

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ABSTRACT

Food wastage is a relevant problem all over the world. Remains of prepared foods increase the waste of resources due to energy and labor used in their preparation. However, food waste has a high energy potential can be converted in the form of methane via anaerobic digestion. This study evaluated the potential for recovery of energy contained in food wastes and presented a way to stablish the anaerobic digestion process using solely food waste. For this purpose, a prototype anaerobic digester was used of complete mixture with a volume of 408 L, 15% of total solids, temperature of 29.4°C and an agitation system. The system was operated at steady state for 51 days in hydraulic retention time of 103 days, volatile solids and chemical oxygen demand of 0.80 g L^{-1} rd^{-1}**.** According to the literature, the stabilization period presented typical inconvenient of food wastes digestions processes, that was solved monitoring at more frequent intervals the volatile fatty acids and with the maintenance of a compatible volume of organic load according with the size of the reactor. It was obtained a reduction of 90% in volatile solids and 82% in chemical organic demand. The methane production was 0.51 $L.g^{-1}$CODc, 0.44 $L.g^{-1}$VSc and volumetric yield of 0.32 $L.L^{-1}rd^{-1}$, representing 59% of the composition of the biogas. The adequate levels of agitation frequency, feeding load, temperature and C/N ratio were found in this study using the prototype anaerobic biodigester.

Keywords: Bioenergy, Biogas, Co-digestion, Waste bioconversion.

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