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## BIOGAS PRODUCTION FROM CORN BIOETHANOL WHOLE STILLAGE: EVALUATION OF TWO DIFFERENT INOCULA

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### Abstract

Whole stillage, the by-product of the corn-based ethanol industry, contains organic residues of the alcoholic fermentation process that can be further degraded by anaerobic digestion. The resulting biogas can be used on-site, bettering the energy balance of the ethanol production. In this work whole stillage has been characterized by physico-chemical analyses in order to evaluate the degradation efficiency using different inoculum seeds. Two different inoculants (granular and suspended type) were subjected to microbial characterization. Besides the traditional culture-dependent characterization, ester-linked fatty acid methyl esters (EL-FAME) analysis has been carried out on the two inocula, for better characterization of the microbial communities. In addition, batch anaerobic degradation assays have been performed under mesophilic conditions in order to assess biogas production rates when using different inocula. Significant differences have been found both in the composition of the analyzed inoculants and in their methane production capability. Our results indicate that the granular inoculum is potentially more efficient with regard to methane production from whole stillage.

**Keywords:** anaerobic digestion, biodegradation assay, corn bioethanol, inoculum characterization, ester-linked fatty acid methyl esters, whole stillage

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