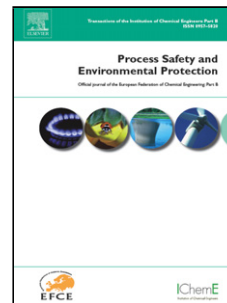


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## Enhancement of Biogas and Methane Production by Anaerobic Digestion of Swine Manure with Addition of Microorganisms Isolated from Sewage Sludge

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### ABSTRACT

In this paper, biogas was produced by anaerobic digestion (AD) of swine manure. This study aimed to isolate, select and identify microorganisms able to increase waste conversion into biogas rich in methane. These microorganisms were isolated from sewage sludge after the beginning of the AD process. Inocula of isolated microorganisms were added to the samples of swine manure. The animals from which the manure was obtained were fed with oat (O) or with swine feed (F). Inoculum addition increased methane mole fraction for O-manure sample from 0.35 to 0.60 and for F-manure sample from 0.40 to 0.70 (average values). An experimental design ( $2^k$ ) was used to determine statistical significance of liquid medium addition and initial pH value. Both factors had a significant effect on the methane volume produced. In summarize, microorganisms addition increased biogas volume and the methane mole fraction in it.

**Keywords:** anaerobic digestion, swine manure, inoculum, biogas, isolation.

### 1 INTRODUCTION

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