

Single Cell Protein from Land Fill Gas

Jason Price and Deenesh Babi

¹DTU Chemical Engineering, Technical University of Denmark
s090428@student.dtu.dk, s090170@student.dtu.dk,

INTRODUCTION

Municipal solid waste (MSW) landfills are one of the largest human-generated sources of methane emissions in the United States and other countries globally. Methane is believed to be a very potent greenhouse gas that is a key contributor to global climate change, over 21 times stronger than CO₂. Methane also has a short (10-year) atmospheric life. Because methane is both potent and short-lived, reducing methane emissions from MSW landfills is one of the best ways to achieve a near-term beneficial impact in mitigating global climate change. The United States Environmental Protection Agency estimates that a landfill gas (LFG) project will capture roughly 60-90% of the methane emitted from the landfill, depending on system design and effectiveness. The captured methane can be then purified and used for industrial applications, as in this case the production of SCP. Utilizing methane in this way decreases its demand from fossil fuels which is its traditional source.

SUMMARY

It is likely that the world's population will double in the next few decades, yet the United Nations estimate that about one thousand million people are already suffering protein deficiency. It is estimated that between 1980 and 2000 the annual demand for protein as food for humans will increase from 50 x10⁶ tons to 79x10⁶ tons, and the demand for protein as feed for animals will increase from 44 x10⁶ tons to 108 x10⁶ tons. Biotechnology is being applied to the rapid improvement of conventional food sources, both plant and animal, in an effort to meet the increased demand in food. However a limit will be reached on the extent of these technologies and new technologies comprising new and innovative methods to produce protein to meet the current and growing protein demand globally must be developed. One of these technologies is the production of protein from single cell micro-organisms termed single cell protein (SCP) which provides promising activity in order to meet the growing protein demand especially for farm animals.

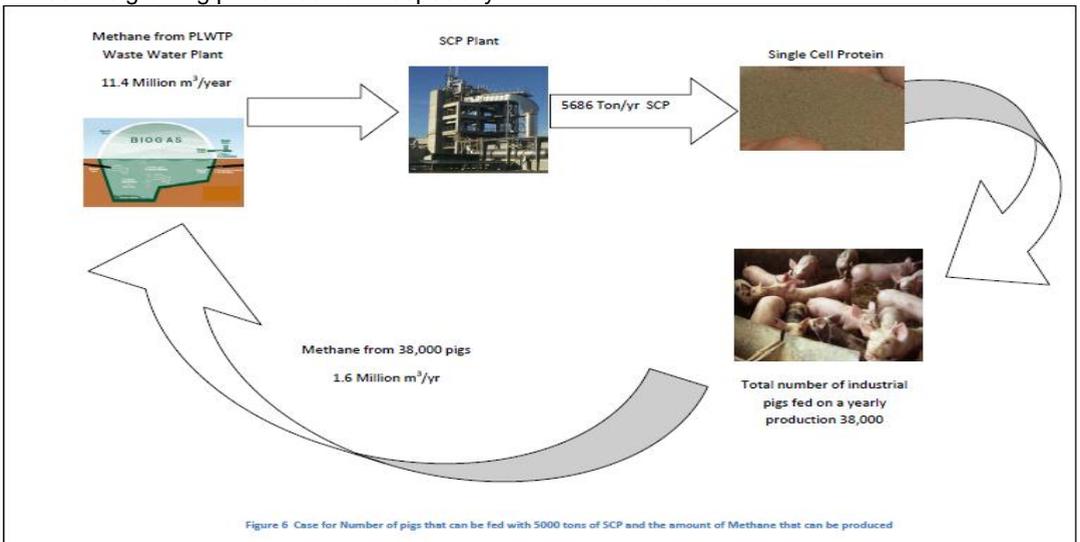


Figure 6 Case for Number of pigs that can be fed with 5000 tons of SCP and the amount of Methane that can be produced