

Optimisation of dry-batch AD of OFMSW

Stream

Ildefonso Rocamora Miguel, Raffaella Villa, Stuart Wagland, Oliver Fernández, Eddie Simpson, Yadira Bajón Fernández

The Industrial Doctorate Centre for the Water Sector

Introduction

Although dry-batch AD is a common process for treatment of the organic fraction of municipal solid waste (OFMSW), operation can be optimized to avoid low methane production due to low mixing and heterogeneity. This project aims to understand the impact of the different operational parameters on methane production and kinetics.

Key parameters tested

Inoculum to substrate ratio (I:S)

- Experiments with different mixtures
- I:S : 1/2 to 1/16
- 28 days digestion
- Experiment in triplicates
- 2.6 L anaerobic digesters (ADs)

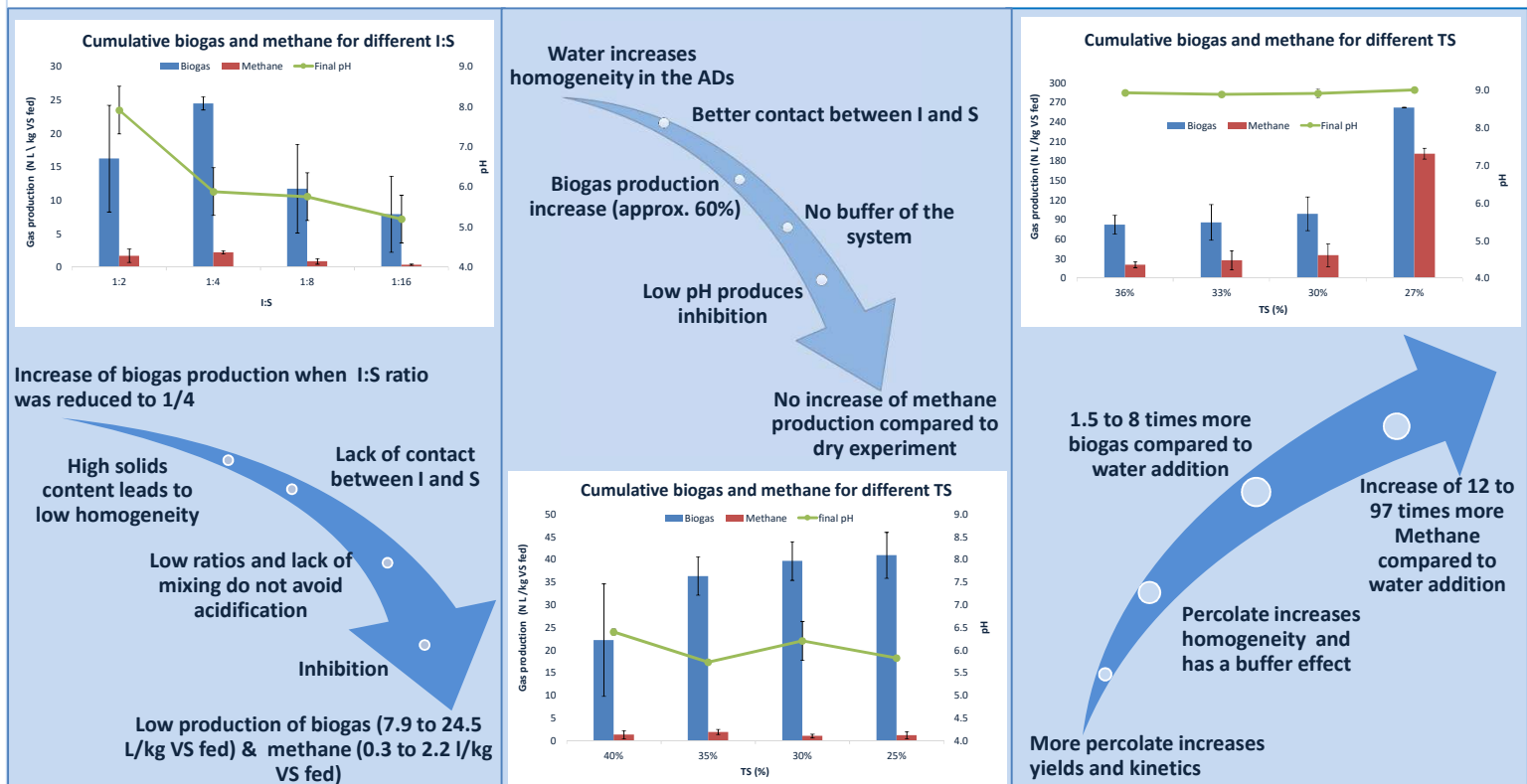
Total Solids (TS)

- Constant I:S of 1:4
- Water addition to create different TS (40 to 25%)
- 28 days digestion
- Experiment in triplicates
- 2.6 L ADs

Percolate addition

- Liquid inoculum obtained from the solid digestion
- Constant I:S
- Percolate addition to create different TS (36 to 25%)
- 28 days digestion
- Experiment in triplicates
- 2.6 L ADs

Results



Conclusions

- High solids contents leads to low homogeneity and localised inhibition
- Adequate amounts of digestate help with inhibitory problems like acidification
- Water addition improves homogeneity, but does not avoid acidification
- Percolate improves homogeneity and buffers the system, avoiding acidification due to increased alkalinity
- Optimization of operational parameters is key to increase stability and performance in dry-batch AD of OFMSW

www.stream-idc.net



For further information: Ildefonso.rocamora-miguel@stream-idc.net
Postal Address: Cranfield University, College Rd, Cranfield, Bedford MK43 0AL