

Department of Sciences and Technology of Biomass

PhD thesis in Food Quality

Co-digestão de resíduos de uma fábrica de aperitivos com vista à maximização do rendimento em biogás e metano

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Graduation in Chemistry Applied.
Master in Food Technology and Safety.
Main field of research: anaerobic digestion, biogas and methane increase, thermal and mechanical pre-treatments



Objectives

- Study of anaerobic digestion of food wastes, like potato peel residue, under thermophilic and mesophilic conditions.
- Evaluation of biogas and methane increase after thermal and mechanical pre-treatments.
- Chemical characterization in order to assess the wastes biodegradability after anaerobic digestion.
- Biogas quantification and characterization to analyze each pre-treatments efficiency.

Methodology

Anaerobic digestion of food wastes performed in CSTR and UASB at 50°C and 37°C, respectively.

Experimental assays to increase the methane and biogas yield using different pre-treatments:

- Thermal (autoclaving and thermostatic bath for example)
- Mechanic (milling for example)

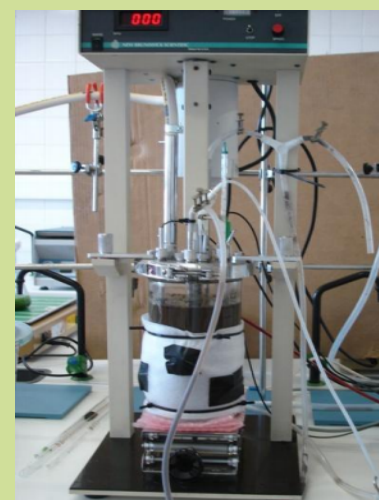
Assays performance:

- Chemical characterization
- Biogas composition analysis and quantification

Expected Results

Increasing the intensity of the pre-treatment increases the biogas and methane yield as can be seen from the early results in the study.

Assay	Biogas accumul. volume (cm ³)	Methane accumul. volume (cm ³)
Control	4413±890	3034±557
Autoclaving at 122°C for 20 min	4046±49	3318±105
Autoclaving at 122°C for 35 min	4921±592	3580±514
Autoclaving at 122°C for 55 min	5402±929	3932±802



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