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KEY-WORDS:

Agri-food wastes, anaerobic digestion, microbial characterization, metagenomics, biomethane production

PROJECT TITLE

Exploitation of agri-food wastes for biomethane production within a biorefinery concept

PROFILE

I am a second-year PhD student in Microbiology, specialized in Food and Agricultural Microbiology

AFFILIATION

Department of Food Science and Technology for a Sustainable Food Supply Chain (DiSTAS)
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LANGUAGES



Mother language



Level C1

HOW TO REACH ME

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Steps of the research

- Physico-chemical characterization of different agri-food wastes to be exploited as feedstock for anaerobic digestion processes in lab-scale reactors.
- Monitoring of microbial consortia composition by means of both culture-dependent and -independent techniques.
- Metagenomic approaches to understanding the diversity and dynamics of microbial community in anaerobic digestion, leading to process optimization by calibrating operational parameters and by enhancing preferred microbial pathways, which will result in higher methane yields
- Biological biogas upgrading, by selecting and enhancing the prevalence of specific microbial populations.

Main Results

The development of a prebiotic feedstock starting from different agri-food wastes, along with a high-performing microbial starter to be exploited in anaerobic digestion processes for bio-methanation purposes.

Research Contribution

The development of a feedstock with prebiotic effects could allow the selection of specific microbial populations that can enhance the production of biogas. Moreover, the utilization of a balanced feedstock could also avoid over-acidification issue, responsible of reactors failure. The selection of a high performing microbial consortia could lead to a possible creation of a microbial starter, specific for anaerobic digestion processes

Collaborations

CRPA (Centro Ricerche Produzioni Animali) - 2023
Dr. Mirco Garuti

Why should you care?

Agri-food processing leads to the production of huge quantities of wastes, large part of which inedible, despite their valuable chemical content. Anaerobic digestion allows agri-food wastes to be reused for the production of renewable energy (biogas). A characterization of these wastes is needed to combine them in the right proportion to increase biomethane production in a biogas upgrading context.