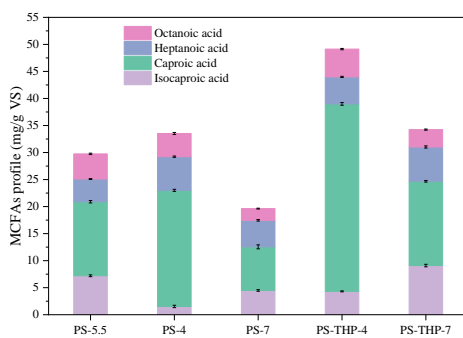
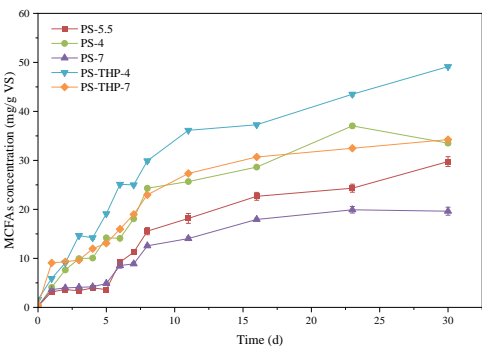
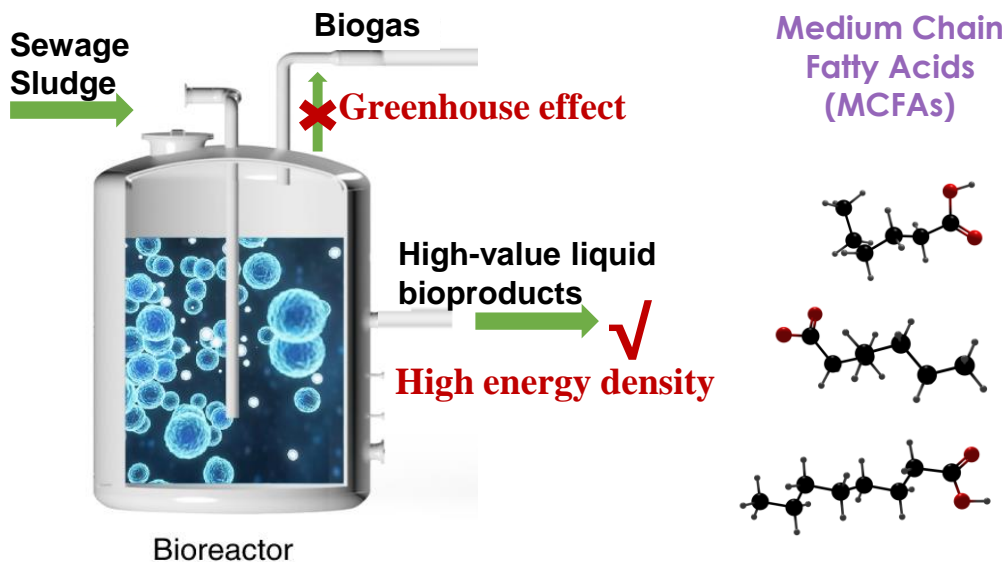


NEWRI INNOVATION

MINING HIGH-VALUE BIOPRODUCTS FROM SLUDGE: POTENTIAL FOR MCFAS PRODUCTION WITHOUT EXOGENOUS ELECTRON DONORS

ABSTRACT

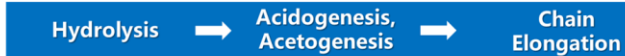
The biological treatment is a commonly used technique in wastewater treatment plants (WWTPs); however, a large amount of sewage sludge produced is a serious problem. Production of medium-chain fatty acids (MCFAs) from sewage sludge is a promising method to realize resource recovery in a high-value dimension other than biogas or volatile fatty acids. In this study, MCFAs generation from different sewage sludge (primary sludge (PS) and waste activated sludge (WAS)) was investigated without additional electron donors (EDs).



MCFAs Production and Profile

MCFAs production from sludge:

Process:



Bottlenecks:

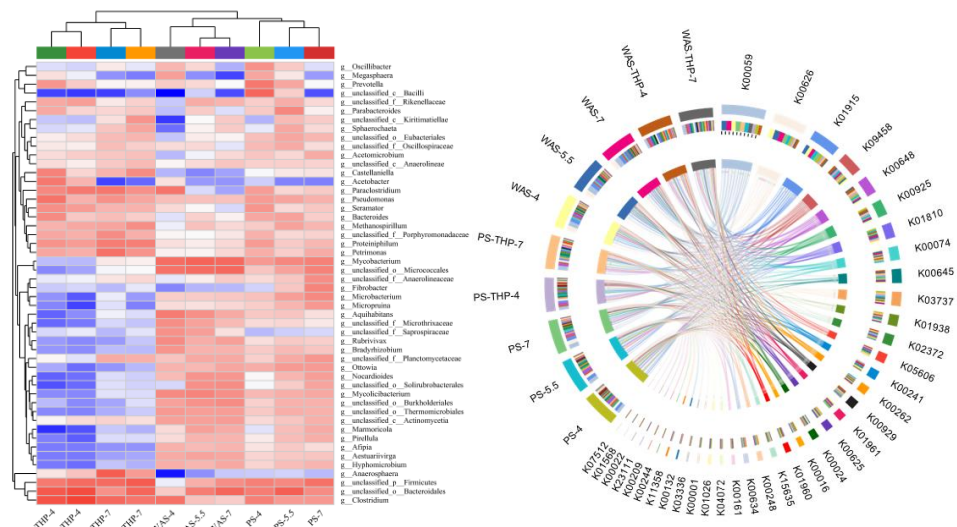
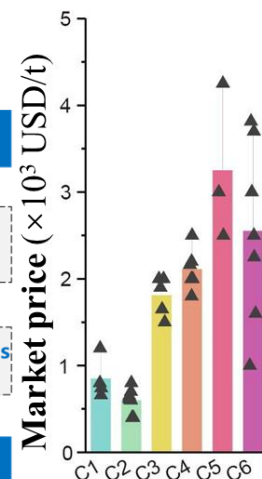


Breakthrough:



Target:

High Efficient MCFAs Recovery without External EDs



Effects of pH regulation and THP on microbial distribution

Effects of pH regulation and THP on metabolism pathway

PERFORMANCE AND MECHANISMS

- Primary sludge is a more ideal substrate than waste activated sludge for MCFAs production without exogenous electron donors.
- Thermal hydrolysis pretreatment (THP) is effective for fibers decomposition and reducing sugars generation, especially in acid pH range.
- pH regulation could largely affect ethanol fermentation and corresponding MCFAs pathways, which could bring a joint-effect combining with THP.
- Sustainable and self-sufficient MCFAs production could be further developed based on an in-situ ethanol fermentation and chain elongation process.

Presented by

Biotechnology and Bioprocesses
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