

## Fats, Oils, and Grease Boost Biogas Production

### Co-Digestion of Organic Waste Products with Wastewater Solids (OWSO5R07)

#### The Central Issue

Adding waste organic feedstock directly to anaerobic digesters operated by water resource recovery facilities (WRRFs) is becoming an attractive way for utilities to generate revenue from tipping fees while boosting biogas production.

#### Context and Background

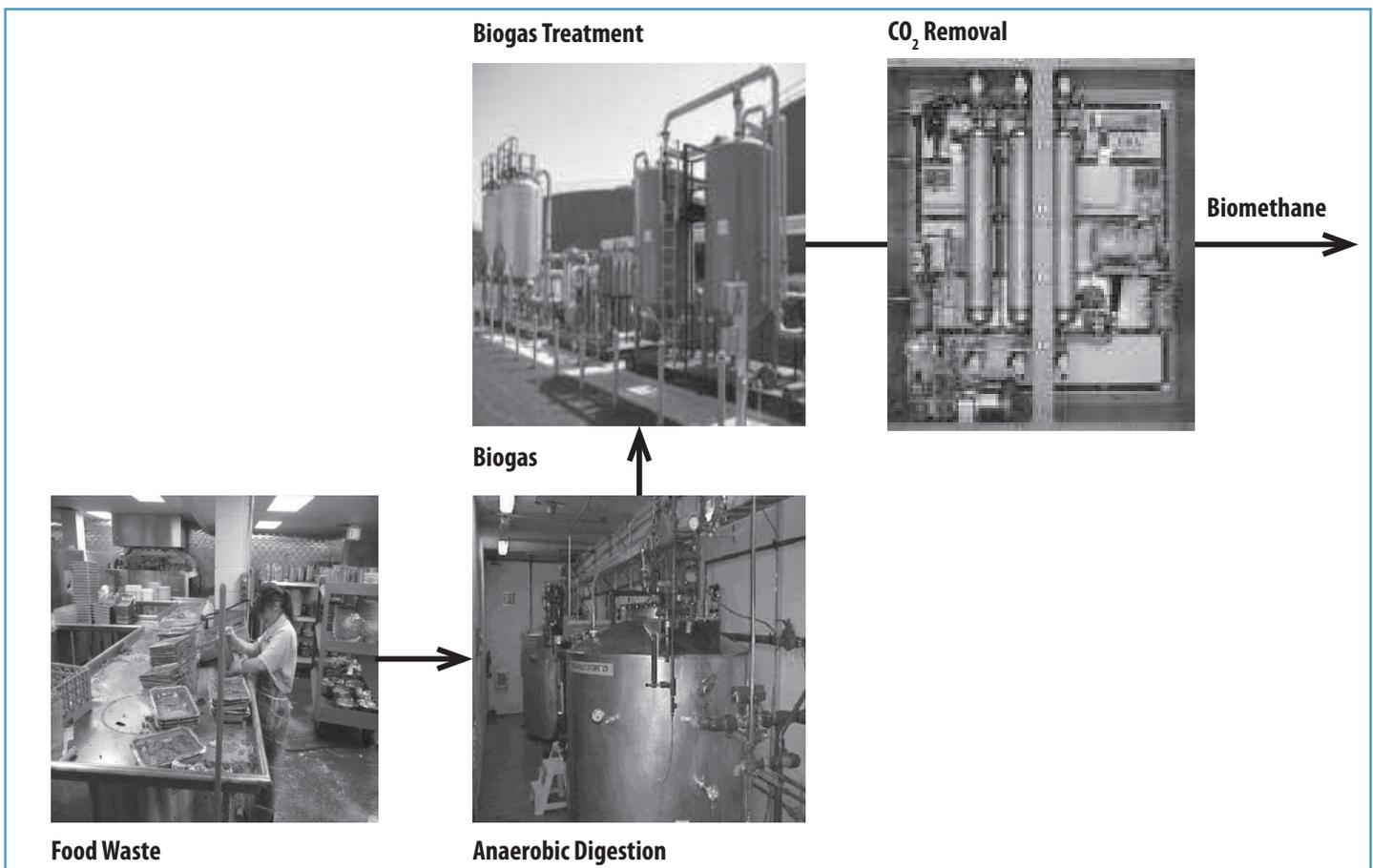
The addition of waste organic feedstock to anaerobic digesters is a new practice and less than half of the WRRFs using anaerobic digestion (AD) currently take advantage of the opportunity to generate revenue and boost biogas production, primarily due to the uncertainty about causing digester upset.

#### Findings and Conclusions

Through lab, pilot-scale, and a study of a full-scale facility (Des Moines, IA), this research addressed some of the operational issues associated with adding waste organic feedstock. It provides a better understanding of the quantity of organic wastes that can safely be added to AD. It also identifies the type of wastes that have a synergistic effect on biogas production when added to biosolids in AD. The research found that fats, oils, and grease (FOG) and glycerol are good organic feedstocks to boost biogas production. The specific energy loading rate (SELR) can be used to help assess the quantity of organic wastes which can be added to a digester before there is potential for digester failure.

#### Management and Policy Implications

Sources of organic wastes and feedstocks must be identified to sustainably boost biogas production. Relationships with waste haulers will need to be established and maintained.



**How food waste is managed will have an impact on water demand and wastewater treatment, energy demand and and recovery transportation, and carbon footprint.**

# Executive Summary



## Co-Digestion of Organic Waste Products with Wastewater Solids

### Related WERF Research

Project Title	Research Focus
Developing Solutions to Operational Side Effects Associated with Co-Digestion of High Strength Organic Wastes (ENER8R13)	Provides information for WRRFs to plan, design, and implement co-digestion programs with clearer expectations, improved process design, and more consistent operations.
Co-Digestion of Organic Waste – Addressing Operational Side-Effects (ENER9C13)	Provides WRRFs with tools to help them to better understand the implications of co-digestion and reduce roadblocks and uncertainty associated with the process.
Co-Digestion of Organic Waste – Addressing Operational Side Effects (ENER12R13)	Furtheres the research done in the WERF ENER9C13 project to provide WRRFs with information to help them better understand the implications of co-digestion and reduce roadblocks and uncertainty.
Wastewater Treatment Anaerobic Digester Foaming Prevention and Control Methods (INFR15G10)	Identifies gaps in existing knowledge and provides guidance on the causes, measurement methods, effects, prevention, and control of AD foaming in WRRFs. Provides case study reports of foaming causes, methods of foam detection, control and mitigation methods for each of the five full-scale plants studied.  Synthesizes critical literature findings, collected survey data, and testing results to elucidate significant findings on anaerobic digester foaming and control. Includes a guidance document that discusses a systematic method to evaluate and control anaerobic digester foaming due to all possible causes.
Evaluation of the Efficiency of Biogas Treatment for the Removal of Siloxanes (OWSO10C10)	Contaminants must be removed from biogas before heat and power be generated. This research demonstrates that silica gel media may be a viable media for removing siloxane contaminants in biogas, particularly if the biogas has high H <sub>2</sub> S, as well as siloxane content.
Barriers to Biogas Use for Renewable Energy (OWSO11C10)	Includes an evaluation of the social, business model, regulatory, technical, or other type of barriers to greater implementation of biogas energy or heat recovery by the wastewater industry. Explores the potential use of biogas for vehicle fuel.

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