

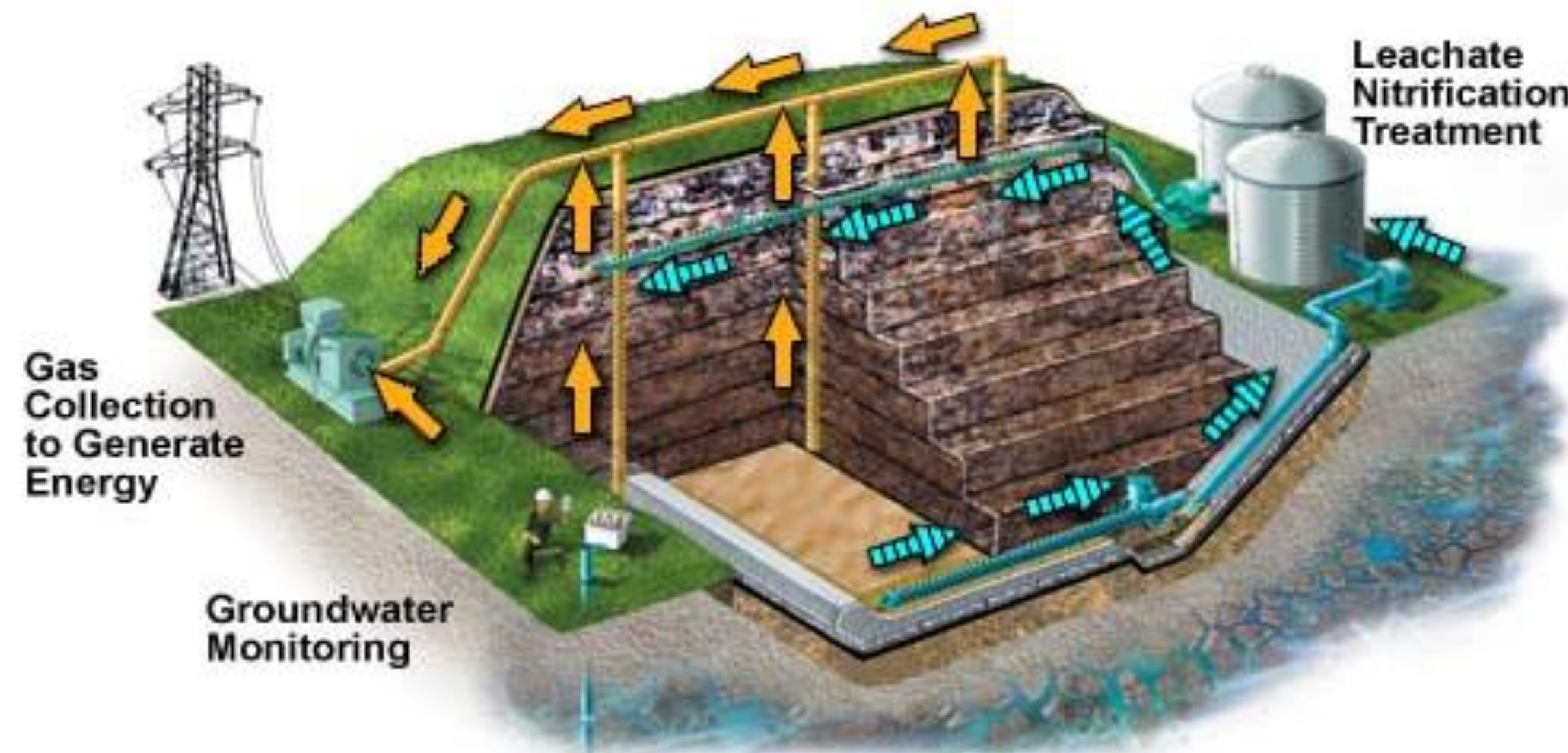


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**Objective:** The IRC does basic and applied research to provide long-term disposal solutions that recognize solid residues as a sustainable source of renewable energy for tomorrow. Projects

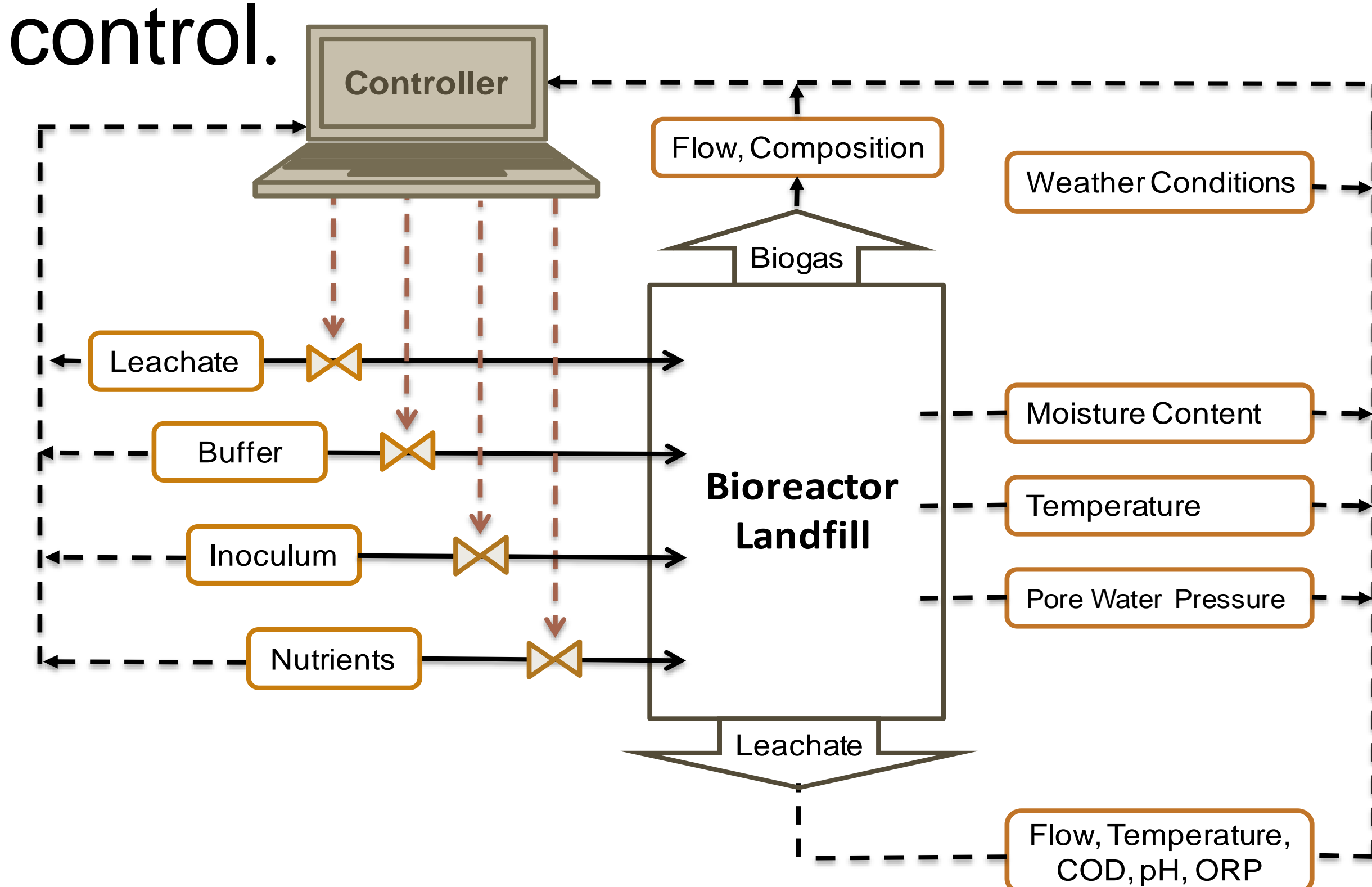
#### LANDFILL BIOREACTORS

Bioreactor landfills employ specific operational modifications to enhance microbial decomposition and increase produced biogas.

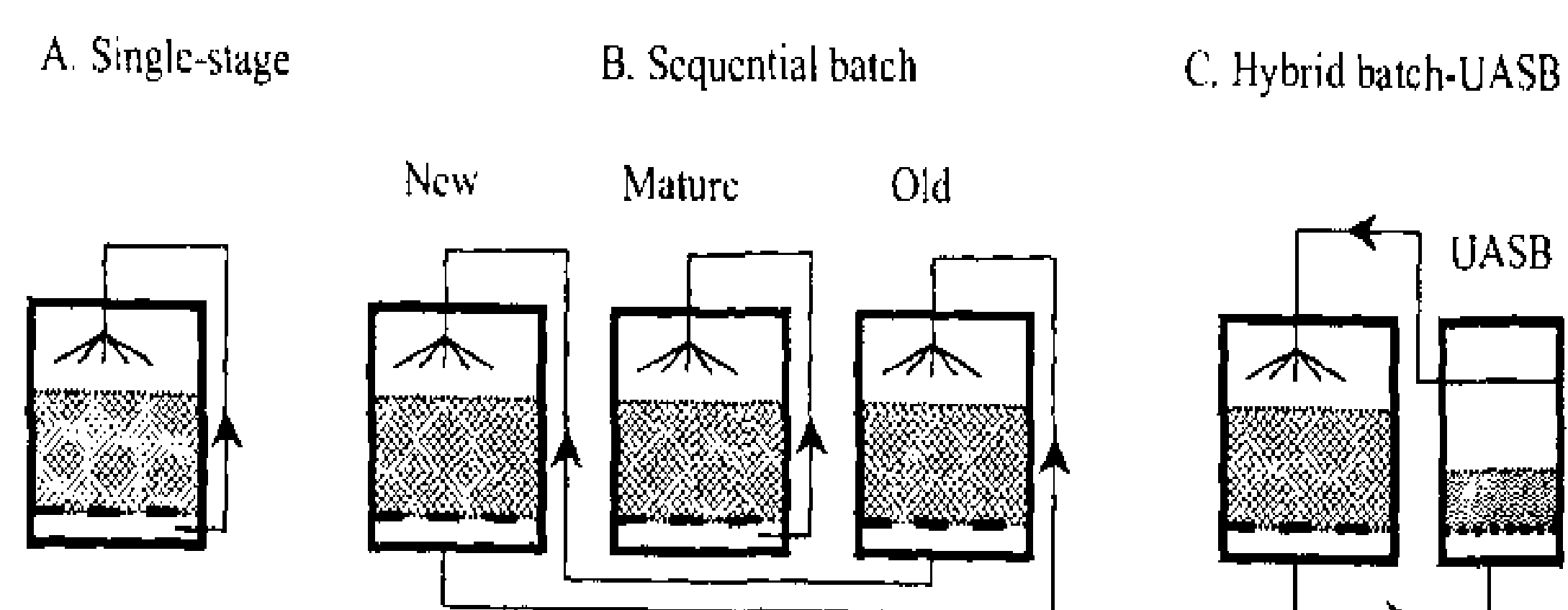


Courtesy of Waste Management

Explore applicability of advanced modeling techniques such as fuzzy logic and neural networks for bioreactor landfill monitoring and control.



Develop High-Rate Staged-LFB via sequential stage control of nutrients, moisture and humic substances.

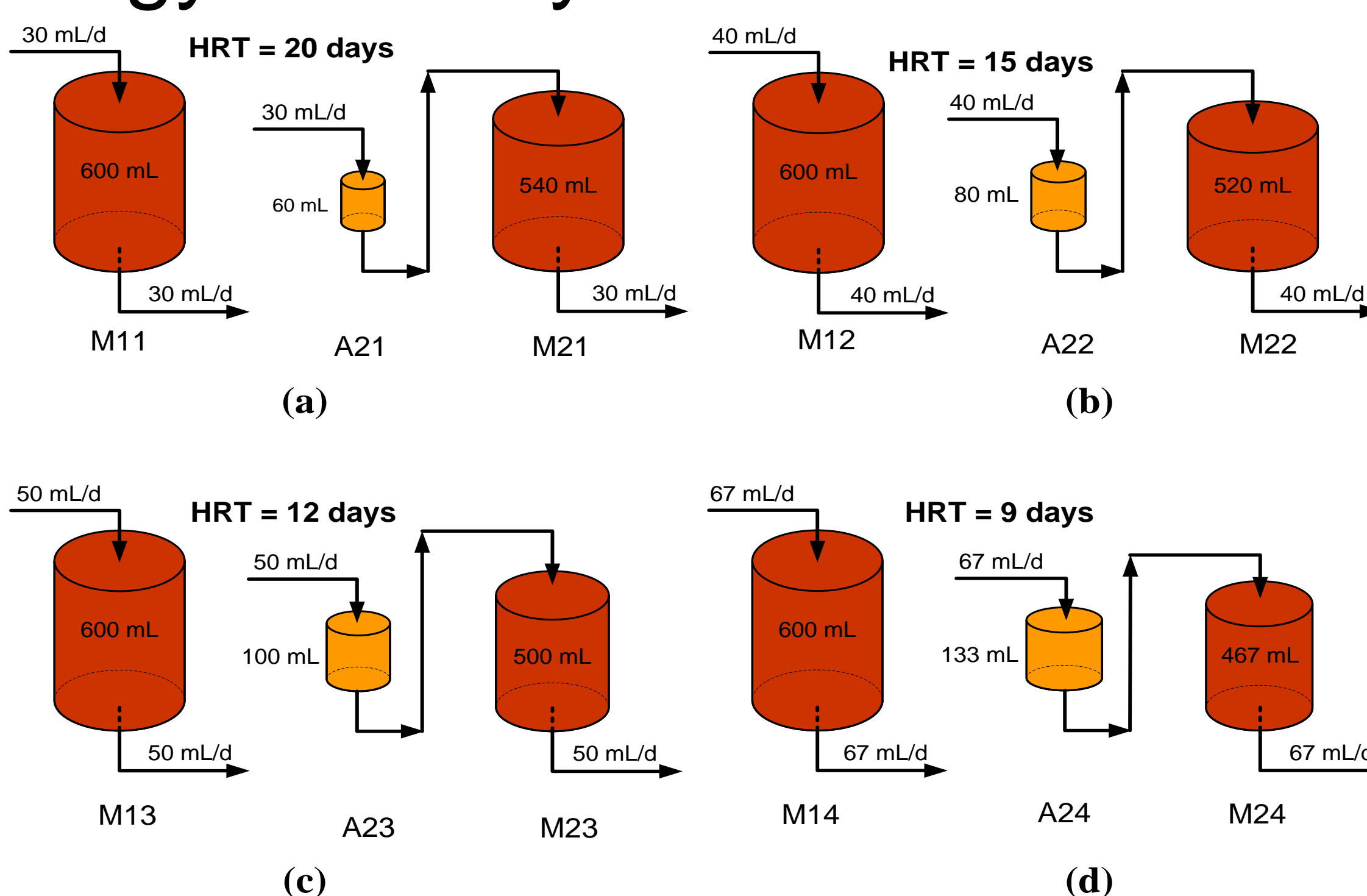


#### EXSITU ANAEROBIC DIGESTION

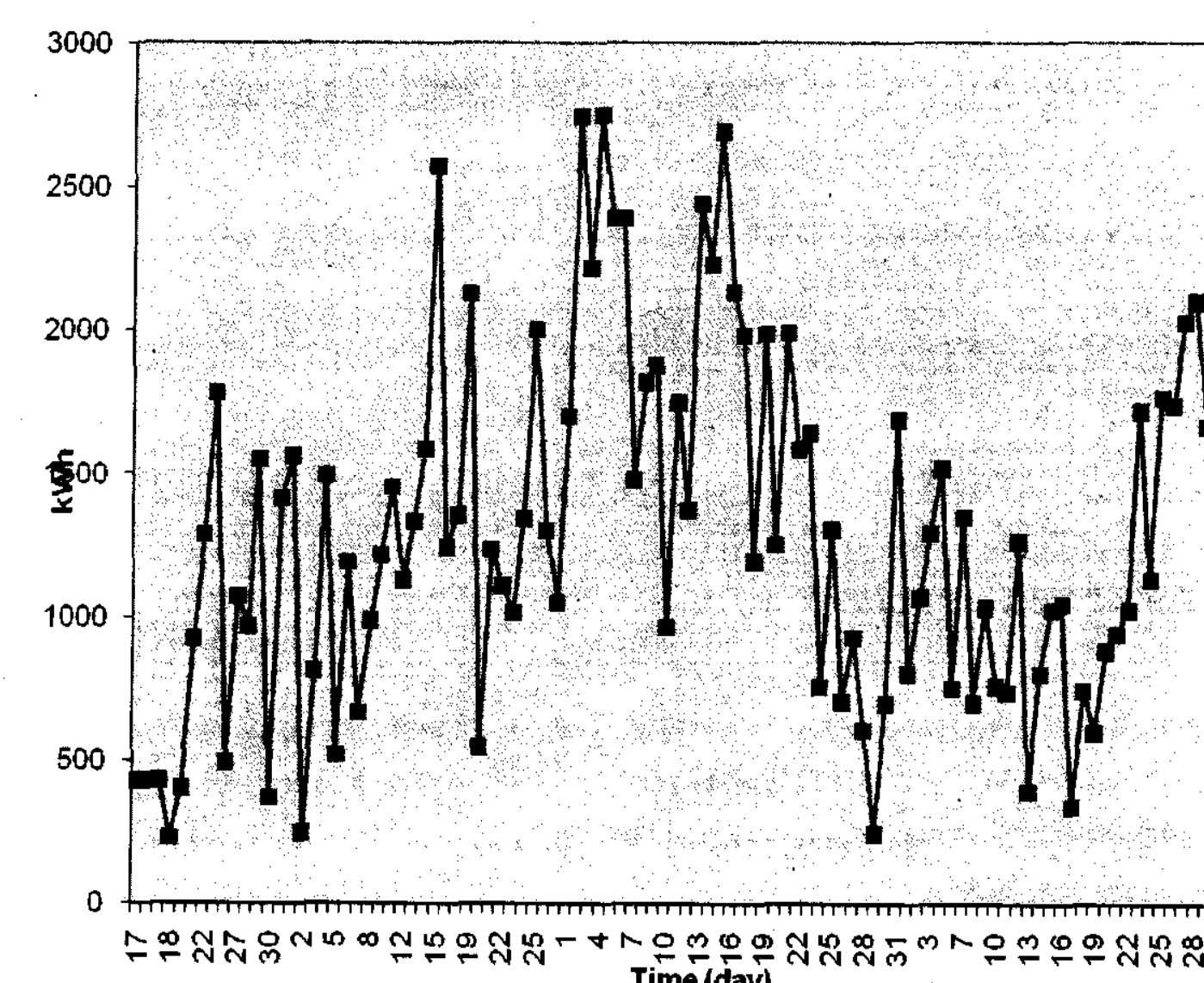
Apply stand alone reactor technology to digest solid residues for energy production.



Evaluation of reactor staging and temperature phasing to optimize reactor conditions for enhancing energy recovery.



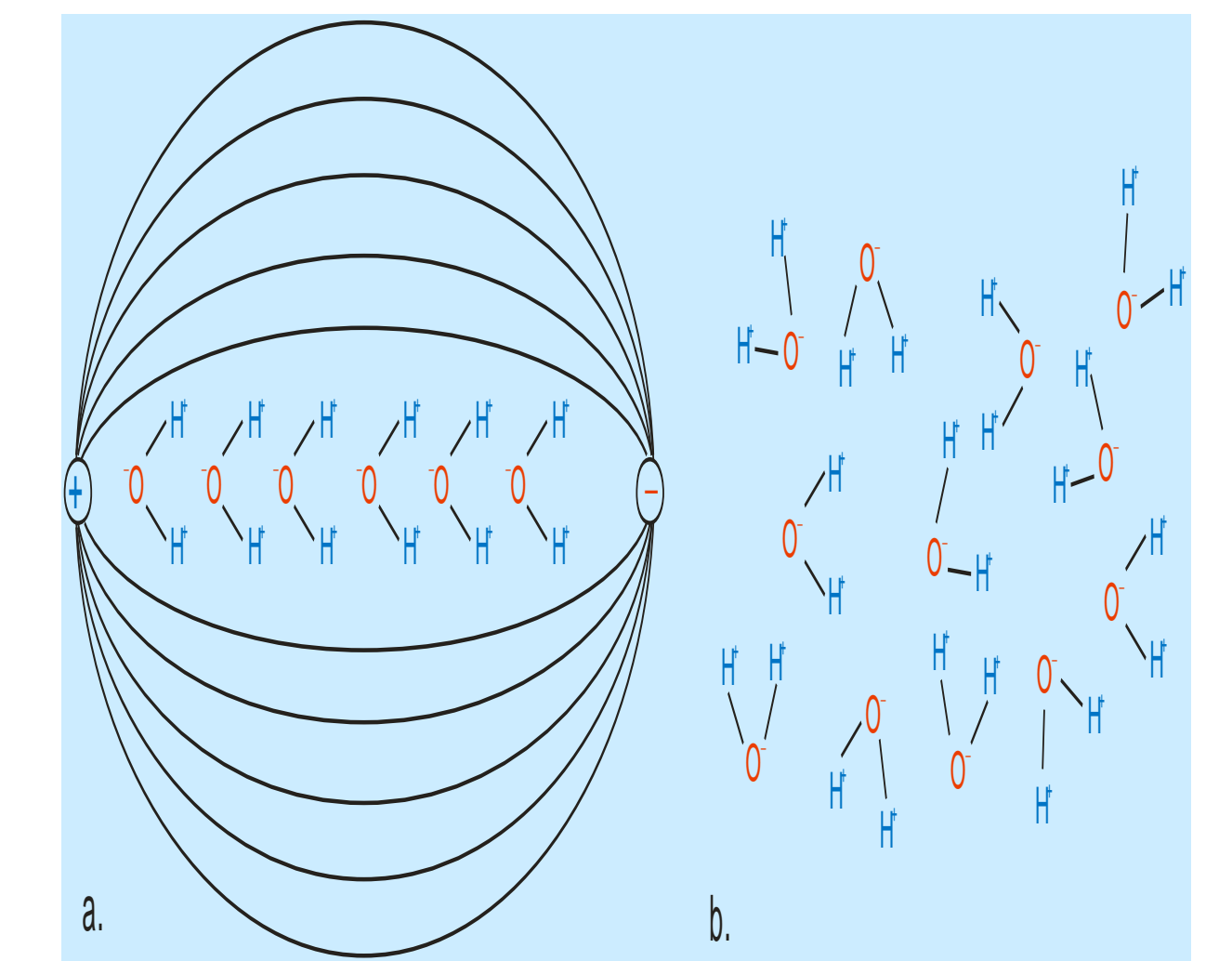
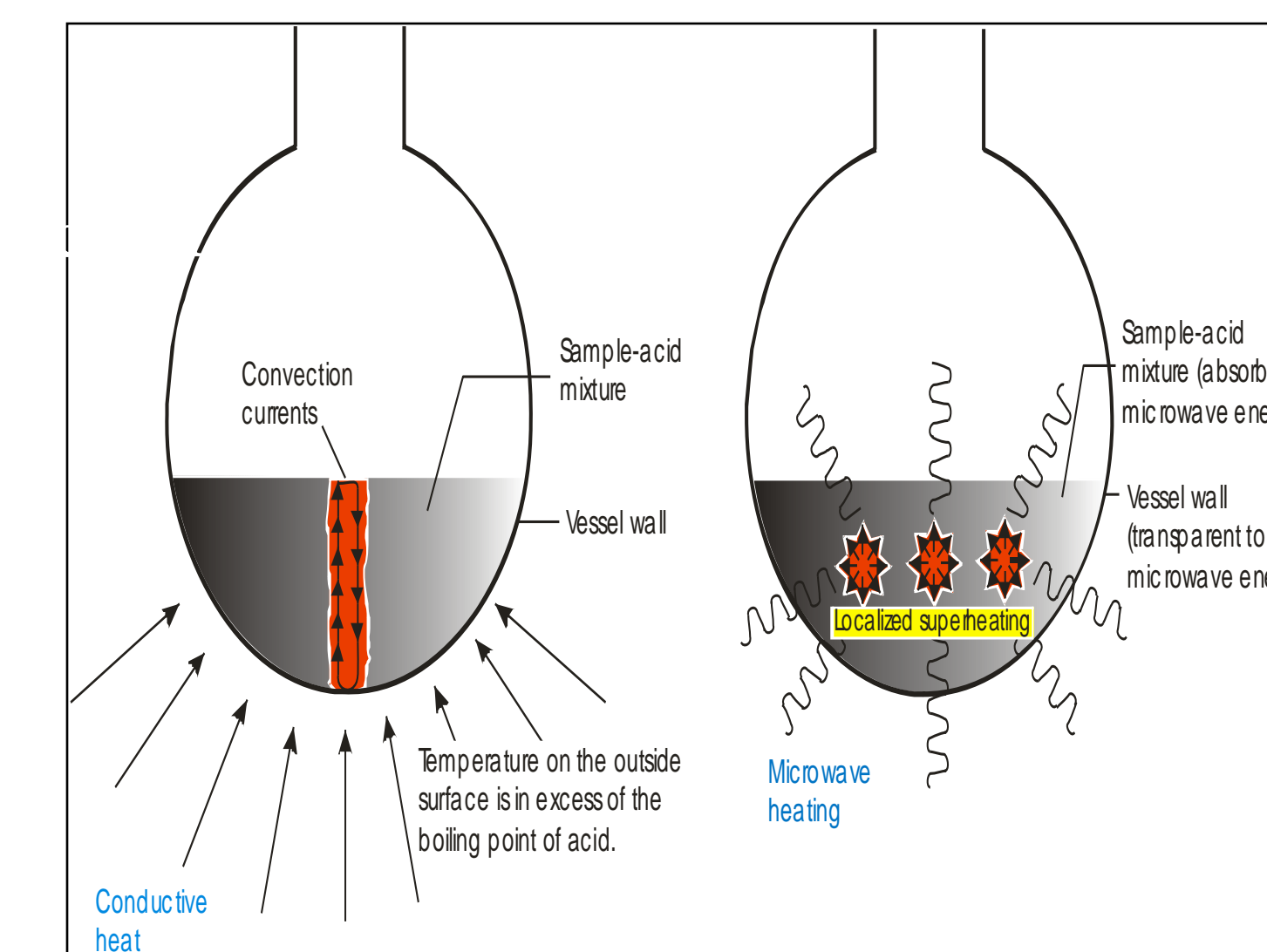
Evaluate the potential of co-digestion of solid residues with high energy agri-food residual streams as fats and grease to enhance anaerobic digestion, methane recovery and product dewaterability



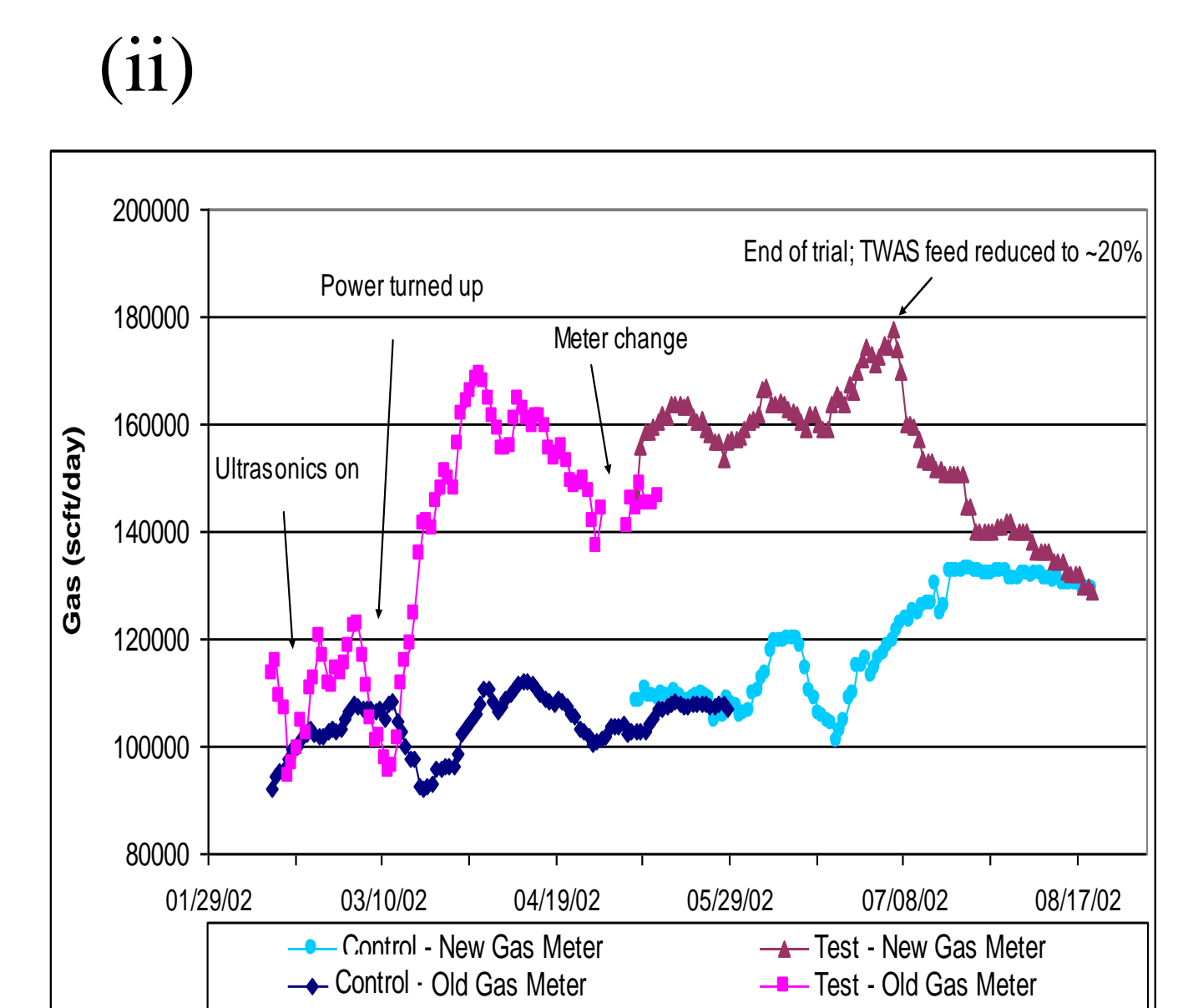
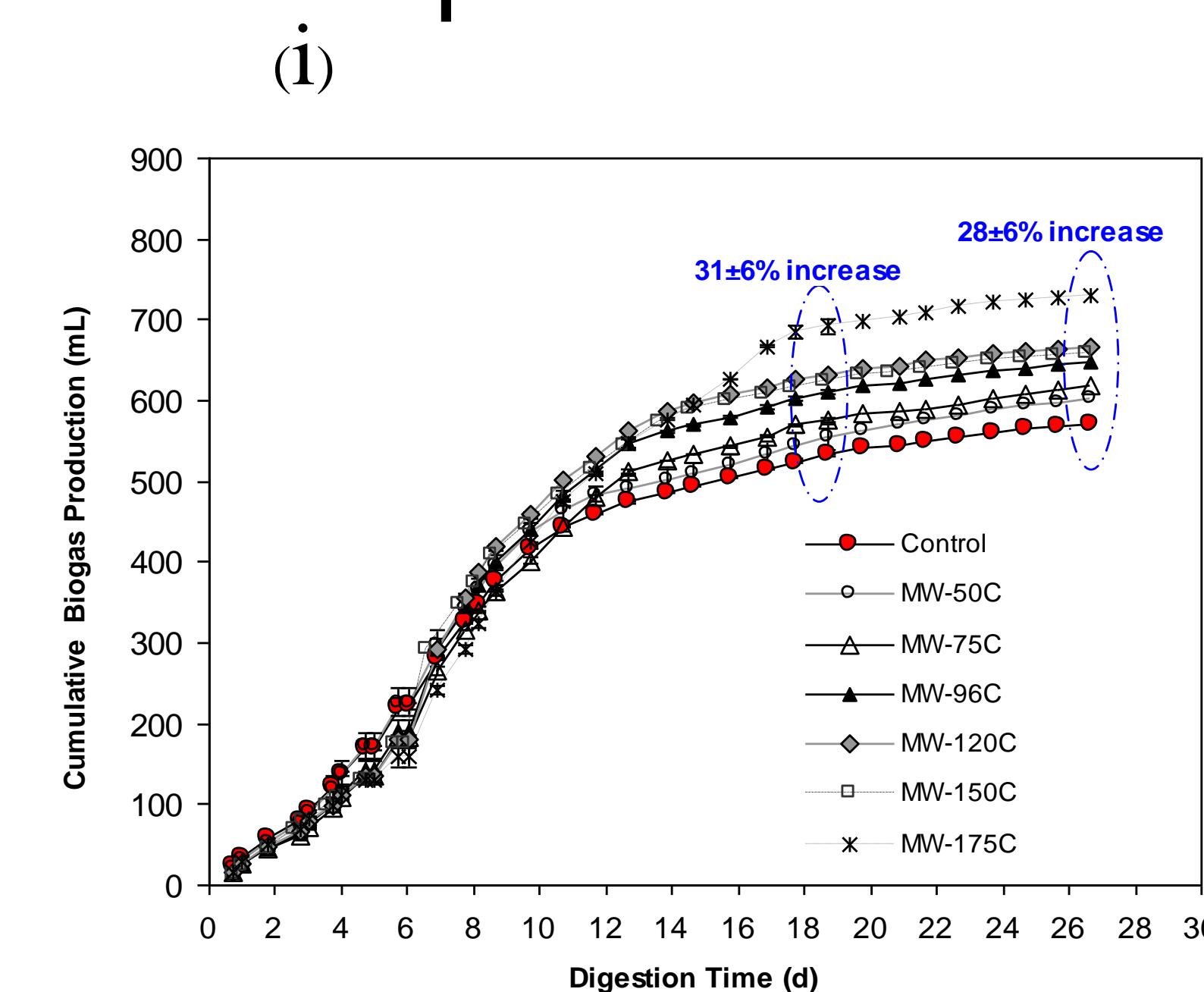
#### RESIDUAL PRETREATMENT

Develop pretreatment technologies (microwaves, ultrasound, pressure disruption chemical oxidation and dual modalities) to solubilize suspended solids to increase rate and extent of biodegradation by enhancing bioavailability and minimizing the hydrolytic "rate-limiting step".

Instantaneous MW heating with dipole rotation of molecules vs. conventional heating.



Enhanced digestion and biogas production of solid residue via (i) MW and (ii) ultrasound pretreatments that increase release of readily degradable biopolymers and COD into the soluble phase



Interested in graduate research in  
**Residuals to Energy *R2E***

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