



## Waste-to-Energy Systems (Anaerobic Digestion)

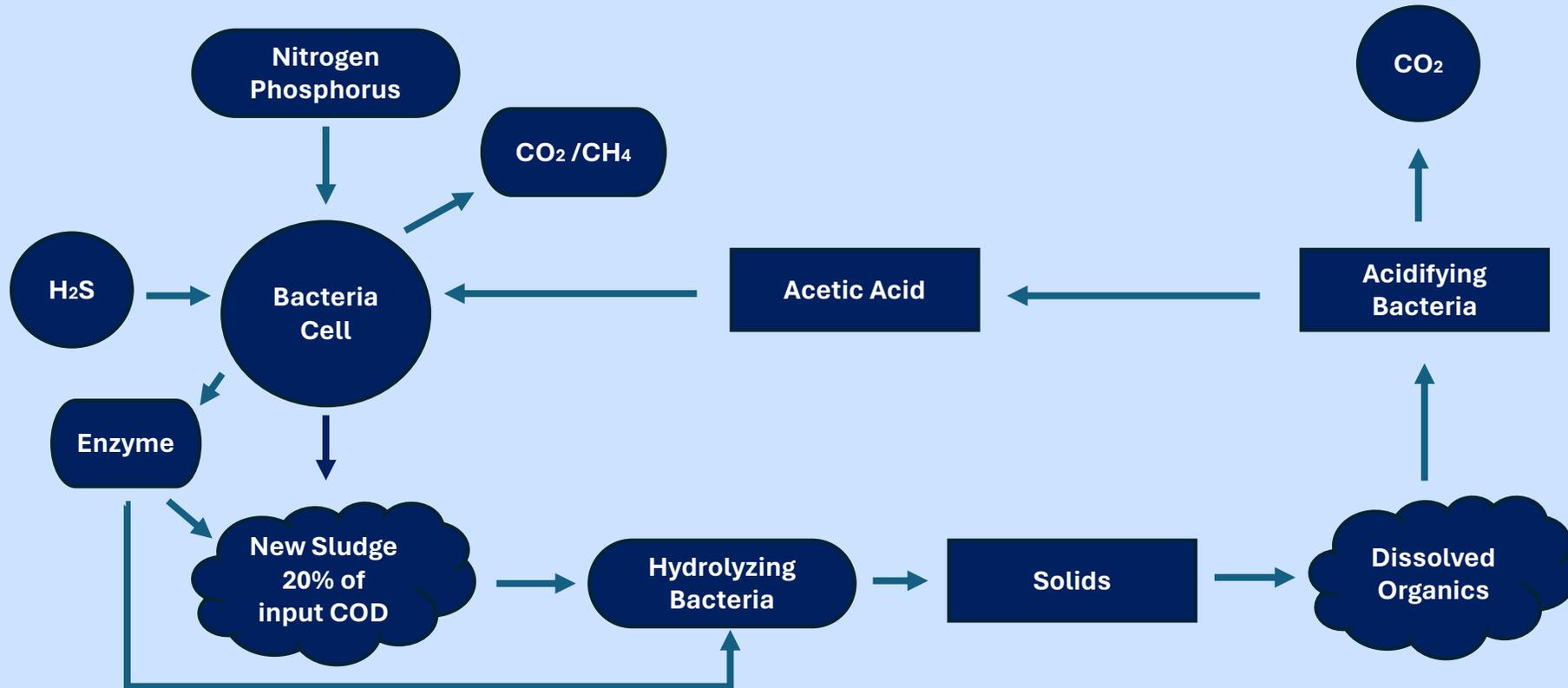
The Ydro Process® is an integrated solution combining targeted microorganisms and advanced analytics to enhance the overall performance of biological treatment processes. In anaerobic digestion systems, the application of the Ydro Process® increases digestion rates, treatment capacity, and overall efficiency.

Systems using the Ydro Process® have the potential to increase biogas production and significantly increase energy output due to a higher methane concentration. Additionally, the low concentration of Hydrogen Sulfide (H<sub>2</sub>S) in the produced biogas minimizes scrubbing requirements.

Ydro Process® microorganisms enhance the existing microbial community's capacity to degrade organic material in anaerobic digesters. These specialized microorganisms leverage different metabolic pathways which accelerate the degradation rate and increase the efficiency of the biological treatment process. The degradation of complex organic molecules leads to the production of volatile fatty acids (VFAs), such as acetic, butyric, and propionic acid. The VFAs are then easily converted to Carbon Dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) in aerobic conditions, or methane (CH<sub>4</sub>) and hydrogen (H<sub>2</sub>) in anaerobic conditions, yielding greater energy production potential.

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# Biological Reactions in an Anaerobic/Facultative Environment



Compared to conventional digestion systems, the Ydro Process® improves biogas production and quality.

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# Integration of Ydro Process® in Anaerobic Digestion Systems

| Biogas Characteristics          | Conventional        | Using Ydro Process® |
|---------------------------------|---------------------|---------------------|
| Conversion of COD/VSS to Biogas | 50 – 60%            | >75%                |
| Methane Concentration in Biogas | 55 – 65%            | >70%                |
| Hydrogen Sulfide in Biogas      | 2,500 – 5,000+ mg/L | <300 mg/L           |



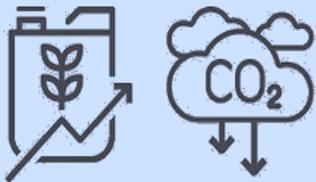
Process starts with food, yard, manure or other types of organic waste



Ydro Process microorganisms are added to feedstock



>75 increase in digestion efficiency and increase in treatment capacity



>20% increase in Biogas production, >75% increase in methane(CH<sub>4</sub>) concentration, and decrease in carbon dioxide concentration



Prevents formation of corrosive hydrogen sulphide(H<sub>2</sub>S) and associated odors



Outcome is increased energy production, lighter digestate, and improved end product quality



## Performance Benefits

- Increased digestion rate
- Greater biogas production
- Higher methane concentration in biogas
- Reduced hydrogen sulfide (H<sub>2</sub>S) in biogas
- Less scrubbing required for biogas conditioning
- Decreased hydraulic retention time
- Improved biosolids quality
- Reduced greenhouse gas emissions due to increased process efficiency

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