

Not all feedstocks for anaerobic digesters are equal. Some substrates contain elements necessary for digestion, but some contain components that produce toxic conditions or lack certain nutrients, impeding methane production.

InnoTech Alberta helps determine how a biogas system will perform using your existing processes. We have in-depth experience with substrates including agricultural wastes, municipal organics, pulp and paper, brewery and distillery, and food production.

FEEDSTOCK EVALUATION

We provide evaluations of organic residuals and waste waters for treatment, suitability, and anticipated performance.

Chemical analysis and physical property characterization

- COD, BOD, and TSS
- Total and extractable: nitrogen, carbon, potassium, phosphorus, and sulphur
- Total ammoniacal nitrogen, total and individual organic acids, and alkalinity
- Electrical conductivity and pH
- Anion and cation profiles
- Particle size characterization
- Metal and mineral characterization
- Colour
- Settleability
- Total and volatile solids

See our comprehensive list:
innotechalberta.ca/OurTeams/BioProcessing.aspx

Biochemical Methane Potential Batch Culture Evaluation

Our batch-culture anaerobic digestion process provides biogas yield and methane, carbon dioxide, nitrogen, oxygen, and hydrogen sulphide content.

- Single substrate evaluations for methane potential
- Evaluation of co-substrate mixtures for biogas yield and toxic effects
- Large 2L culture vessels for material homogeneity.



InnoTech Alberta has an automated, individual flow meter based batch culture system.

PILOT PLANTS FOR PROCESS SIMULATION

Our pilot facilities and laboratories have the capability of emulating full scale facilities to determine the methane production potential for substrates as well as process stability and performance limitations. By-products discharged from the pilot anaerobic digesters can be retained for further processing or chemical/physical characterization.

All of our pilot facilities include:

- Precise temperature control
- Continuous pH and temperature monitoring of each digester
- Constant gas monitoring systems with flow meters for gas production and gas chromatography for gas quality (methane, nitrogen, hydrogen sulphide, carbon dioxide and oxygen monitored)
- Chemical and physical property characterization measured on regular samples
- Control and data acquisition/logging system.

CSTR PILOT PLANT

(FOR PUMPABLE MATERIALS AND MIXTURES)

- Automated system with two 80L continuous stirred tank reactor (CSTR) digesters
- Semi-continuous feeding controlled by a flexible schedule allowing various retention times and organic loading rates
- Schedule-based variable mixing system tailored to your process specifications
- Standard air dosing desulphurization that mimics standard full-scale systems
- Ability to handle a wide range of substrates (including high total solids content).

HIGH RATE DIGESTION PILOT PLANT

(FOR WASTE WATERS WITH LITTLE OR NO PARTICULATE)

- Automated system with two 5L down-flow, fixed film digesters
- Continuous variable flow rate feeding allowing various retention times and organic loading rates.

DRY BATCH DIGESTION PILOT PLANT

(FOR NON-FLOWING, DRY MATERIALS)

- Automated system with two 500L batch bunker style dry digesters and a common 160L percolate digestion tank
- Percolate monitoring system with flow meters and sediment traps for ascertaining substrate suitability
- Schedule-based, variable flow, percolation system tailored to your process specifications
- Standard air dosing desulphurization that mimics standard full scale systems
- Ability to handle a wide range of high total solids and contaminate containing substrates
- Material characterization tests to help evaluate material structure and suitability for dry digestion
- Compression system to simulate pressures associated with material height.

InnoTech Alberta, a subsidiary of Alberta Innovates, is a leading research and technology organization serving the needs of industry, entrepreneurs and the public sector. Our leading-edge expertise and industrial-scale research and demonstration facilities accelerate and de-risk technology development and deployment for our clients with a focus on industrial solutions and commercial applications.

Visit us at: InnoTechAlberta.ca

DIGESTATE PROCESSING PILOT PLANT

(SOLID LIQUID SYSTEMS)

- Continuous throughput, variable speed centrifuge for digestate dewatering
- Aerobic treatment pilot system for further liquid processing
- Ultrafiltration and reverse osmosis pilot equipment.

INTEGRATION STUDIES

InnoTech Alberta can help you determine how converting waste to make energy fits into your existing systems and how it can be used back into your primary process. We have overseen the completion of comprehensive biogas facility engineering packages and routinely consult on:

- Digestion system styles and configurations
- Overall process mass and energy balances
- Overall process integration
- Process development and verification
- Project economic analysis.

SPECIALIZED PILOT PLANT CONSTRUCTION AND TRAINING

- Manuals on evaluation procedures for plant and animal waste material used in biogas plants and laboratories
- Multi-day course on biogas plant operation
- Consulting on developing, implementing or operating biogas facilities
- Training on procedures and equipment for monitoring biogas plants
- Pilot plant design, construction and monitoring for on-site verification work.

**FOR MORE INFORMATION,
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