Biogas Research at NWU, Potchefstroom
Unit for Environmental Sciences and Management
North-West University, Potchefstroom Campus

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Research areas / interests

• Sanitation and organic waste utilization → co-treatment options

• Characterization of microbial communities

• Hygiene and health risks associated with the OW / sanitation service chain
  → pathogens, micro substances and especially antibiotics and antibiotic resistance

• General substrate characterization
SOPs

Sampling and Sample preparation according to VDI4630
“Fermentation of organic materials - characterisation of the substrate, sampling, collection of material data, fermentation tests”

And SOPs (adapted from existing SOPs) to fit local conditions:

SOP1_Faecal Sludge Sampling of Pits
SOP2_Handling and basic preparation of Faecal Sludge Samples
SOP3_Handling of Chemicals incl N2 Gas and Chemical Spills in the Biogas Lab
SOP4_Disposal of Organic Waste Samples
Our AD / Biogas laboratory

3rd National Biogas Conference 2017 | 1-3 November | DBSA
FSM / Biogas Laboratory (cont)
Main tool for capacity building
Batch Test - Incubator Box (37°C)

Incubator box for mesophilic tests
Batch Test - Thermophilic Set (55°C)
Eudiometers

Collected gas

Zero level

Confining liquid reservoir

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Results – Sewage and FS
Biogas Composition

\[
\text{CO}_2 \text{ and } \text{CH}_4 \text{ concentrations: dual wavelength infrared sensor with a reference channel; } \\
\text{O}_2 \text{ and } \text{H}_2\text{S: internal electrochemical sensor}
\]
CSTR Gas Composition
Lessons learned

Success of tests depends on inoculum with established microbial community.

Experiments are a continuous operation: once you start, don’t stop!

Get SOPs and safety protocols in place.

Sampling might require Ethical Clearance:
  Plan ahead – plan carefully
  → especially when informed consent process involved
Stay in touch

@Watnet2017
When it Happens Make Biogas

The Power of Poo Biogas