
ngb
new generation biogas

Introducing…

Archemax®
accelerated biology

The world's first:

- Modular
- Thermophilic
- Two stage
- High-throughput
- Pre-packaged
- Anaerobic Digester…

NGB and Archemax

A paradigm shift…

Targeted at small scale on farm:

- Compact – 50Kwe system in 2500sq feet
- Pre built skids – increased quality, 2 month install
- HDPE reactors – high insulation value, easy transport
- High rate – 5 day HRT
- Massive archea colony – 20% ⬆ in CH4 production
- Real time monitoring – maintains rate and output

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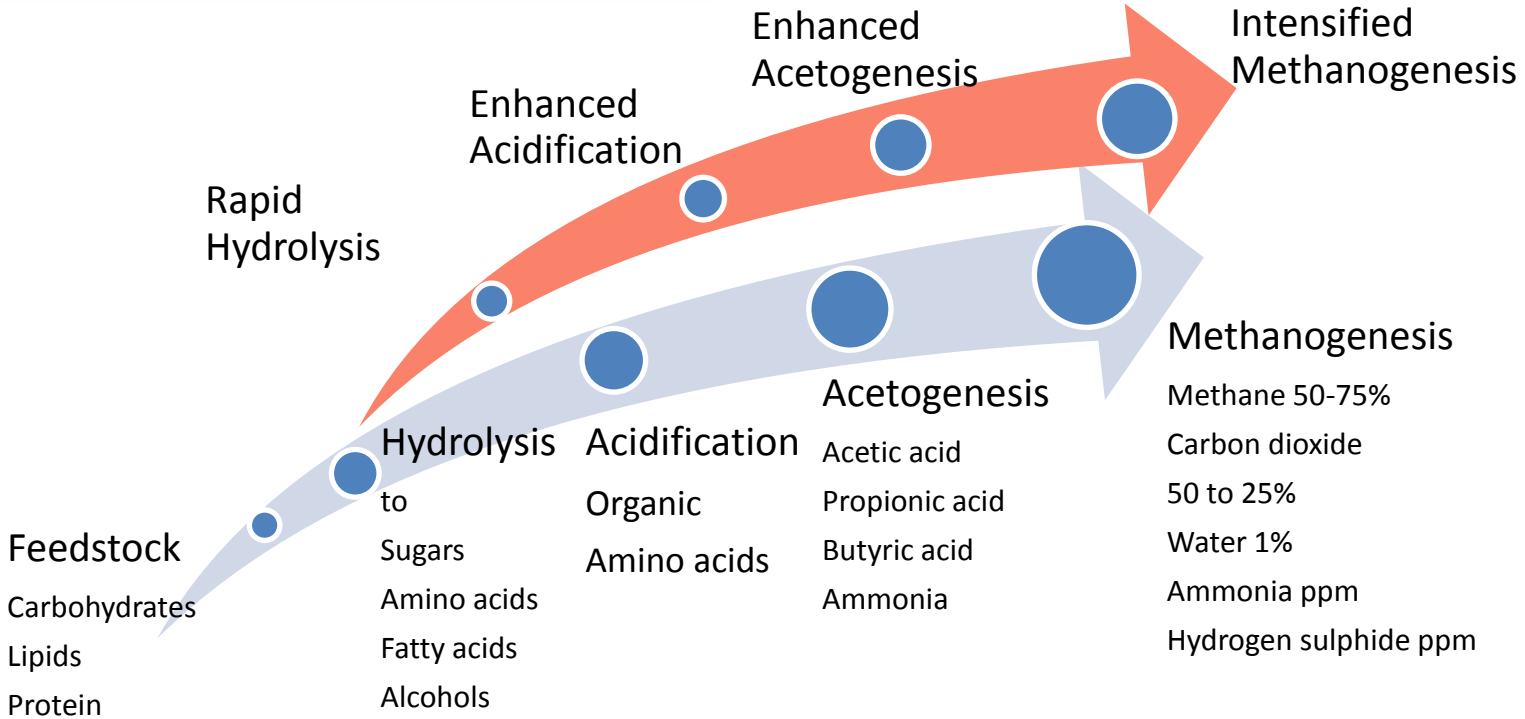
Archemax delivers:

- Higher yields
- Faster processing
- Smaller footprint
- Fast – Install and Commissioning

Archemax effect



Key Performance Indicators

Hydrolysis:

- 95% breakdown of maize silage in 4 days

Methanogenesis:

- Gas production 10m3/m3/day

Stability:

- Feed rate reduced to zero for 5 days
- Gas production recovery
- Reactor temperature reduction 55 degrees to 45 degrees – good recovery

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Every stage of our AD process relies on advanced biology and fuzzy logic control

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The result of a two year R&D programme supported by the Technology Strategy Board

- Fast and stable thermophilic methanogenesis provides high CH4 yields and short retention times

Innovate UK
Technology Strategy Board

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- More original research on accelerators supported by defra, U.K.
- State-of-the-art industrial automation + bespoke adaptive controls ensure that the system is optimally loaded at all times

LINK collaborative research

defra
Department for Environment Food and Rural Affairs

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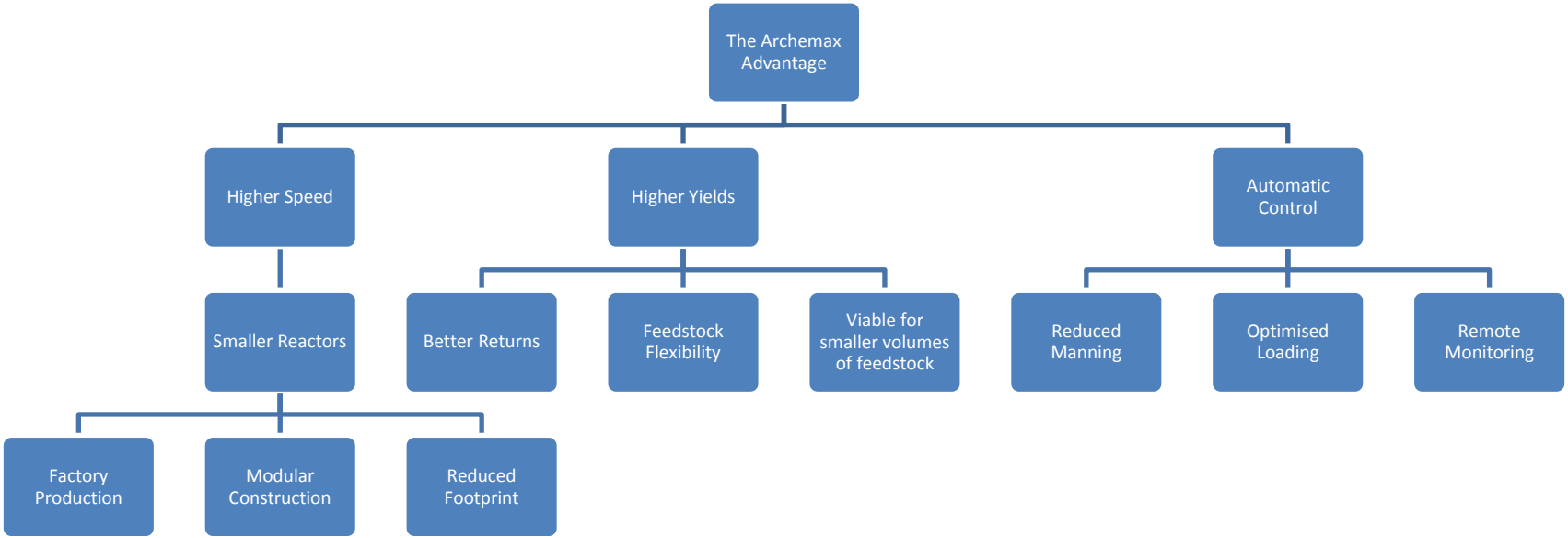

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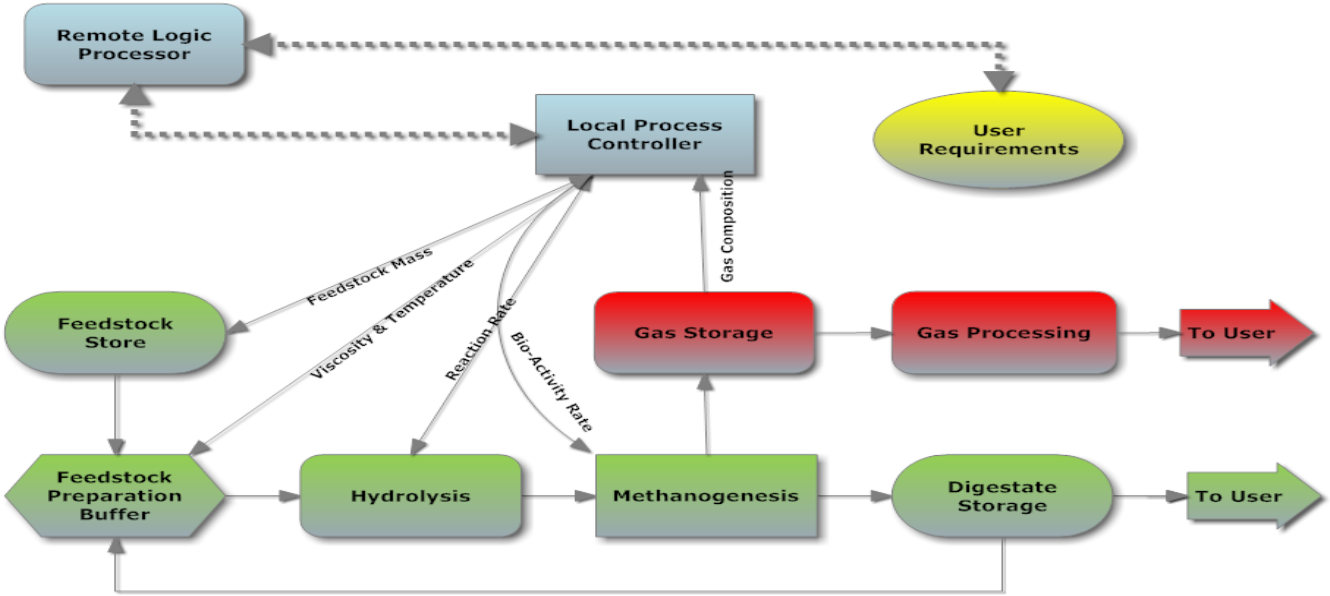

Archemax Operations Flowchart

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The Wheeldon Farm Demonstration Site

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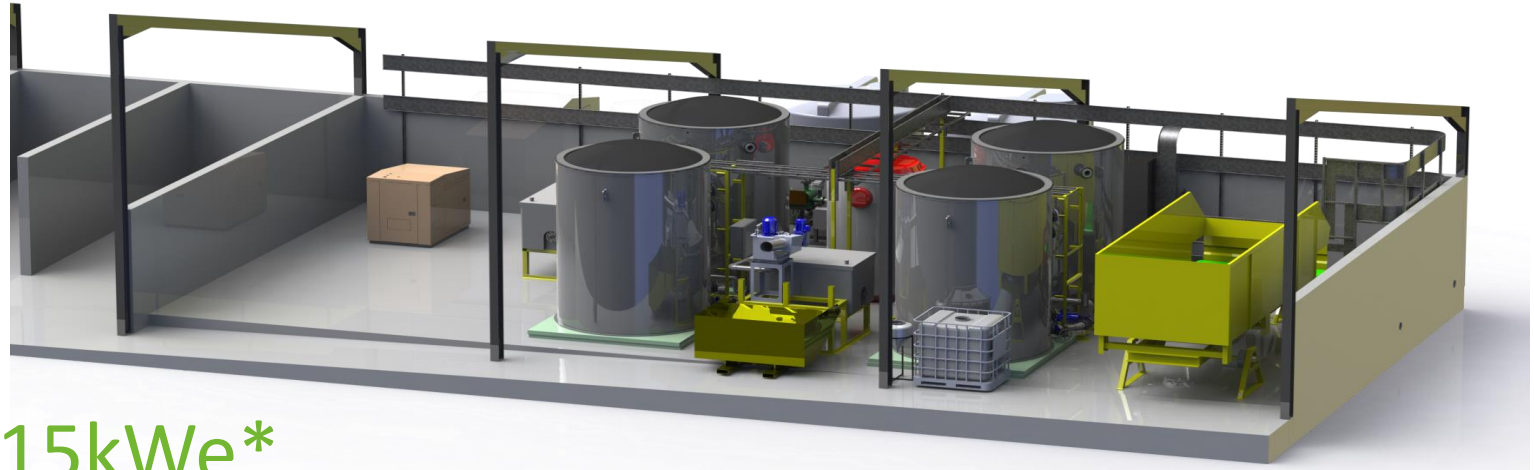

- 15kWe*
- Grass silage only
- Re-use of an existing building

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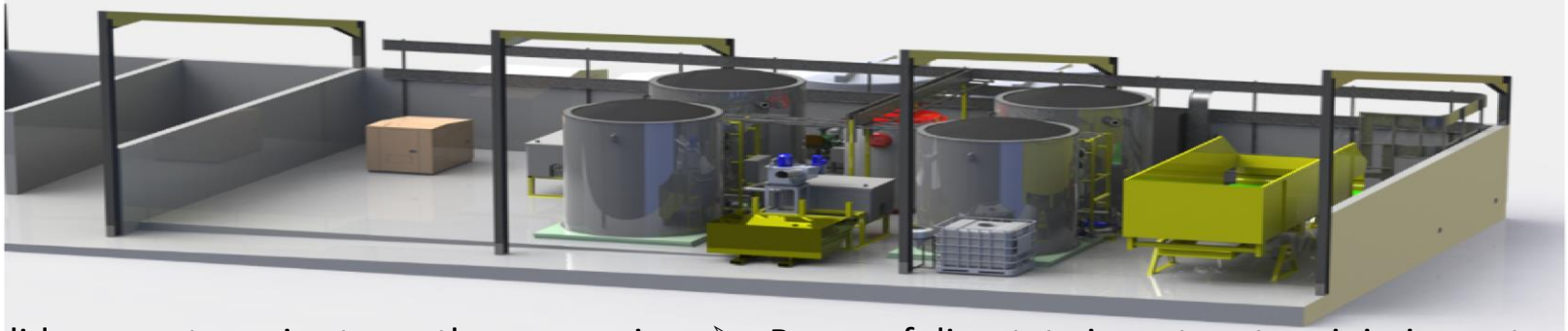
Test Results from Pilot Plant

Test Results from Pilot Plant



- Solids separator prior to methanogenesis
- High speed methanogenesis capable of >10 $m^3/m^3.d$
- >95% COD destruction
- High quality biogas produced >65% methane content
- Reuse of digestate in system to minimise water use and heat loss
- Automated process control
- High speed hydrolysis, 2 days
- Breakdown of >90% of feedstock
- Minimal requirements for chemicals.

Archemax® vs Conventional AD plants

Data sources:
Benchmarking report on critical points and influential factors at agricultural biogas plants
'Efficiency Evaluation of Energy Crop Digestion Plants'
Archemax® test results

Parameter	Unit	Archemax	Std Plant Range	Std Plant Typical
Processing Time	Days	5 to 10 (target) (5 Proven)	30 to 120	50
Loading rate	$kg/(m^3.d)$	20 to 30 (target) (20 proven)	2 to 10	5.6
Biogas productivity @ 55% CH_4	$m^3/m^3.d$	Current rate 5 -10 Expected rate 15+*	0.3 to 3.6	1.7
Technology		Multi-stage High kinetic rate		Single Stage Low kinetic rate
Process control & sensing		Extensive	Minimal	Minimal

*typical measured Archemax gas quality 68% methane

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50kW Energy crop system, in existing farm building

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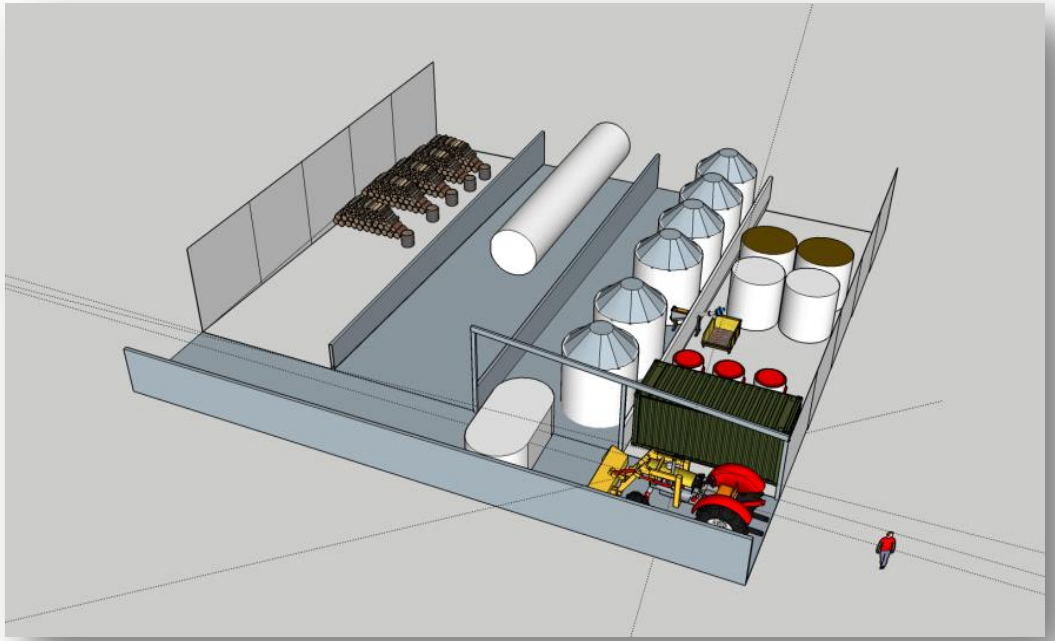
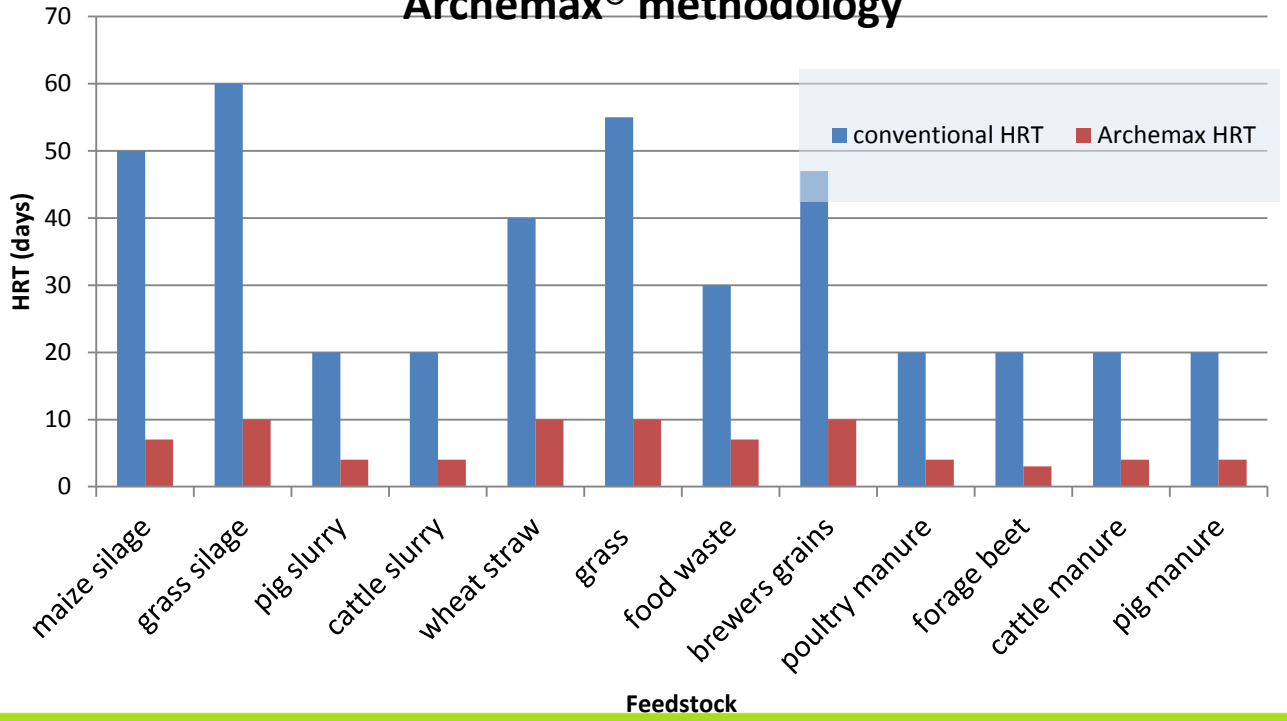
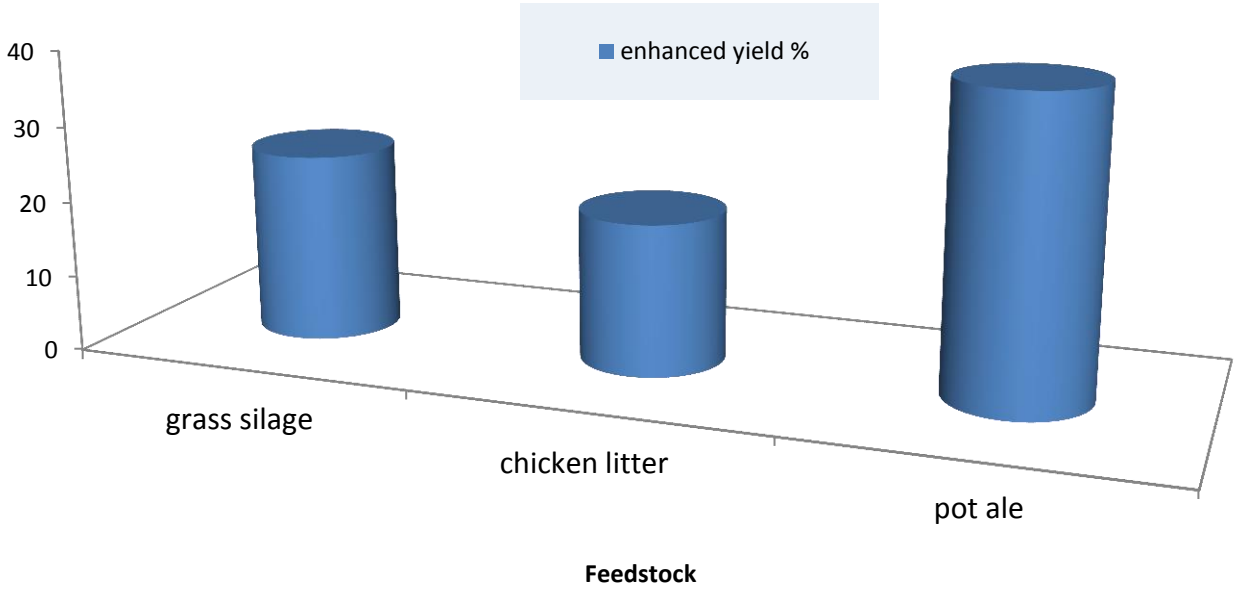


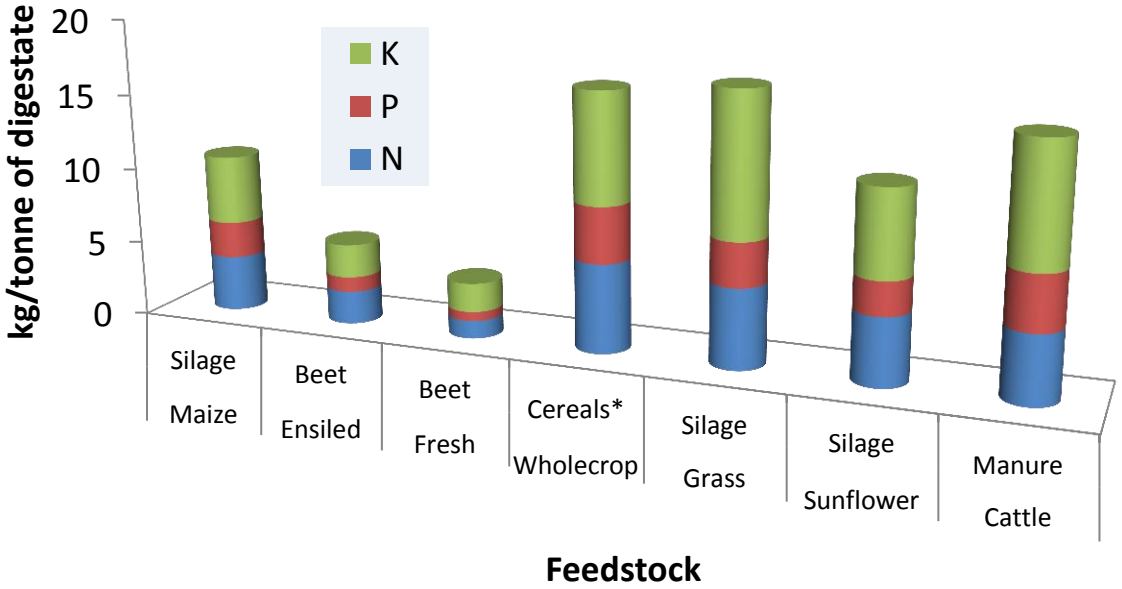
Enhanced throughput using the Archemax® methodology



Archemax® improved yields



Digestate content



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- Maximise feedstock value
  - Smaller volumes become viable
- Maximise on-site energy availability
  - Heating of premises
  - Process heating
- Minimise vehicle movements
  - Simplified planning
  - Better relations with neighbours
  - Rapid build on site < 2 months

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Making small-scale Anaerobic Digestion a viable reality.

Tel. 01803 869833 www.ngbiogas.com

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Principals

Dr. Phil Hobbs: 25 years AD research and 75 papers

Stirling Paatz: 25 years in design and manufacturers of control systems, robotics, and helicopter flight control

Howard Sutton: 20 years in design and manufacture of renewables process engineering including time at NORTEL

Jean Sawaya: 25 year experience in EPC of energy projects from 100kw to 100mw world wide

John Hawkes: 40 years experience in exec positions with world class companies in energy and aerospace and chair of the bio gas association

Your contacts

Wayside Energy ⟶ John Hawkes 416 890 3992

Kronos PMG⟶ Jean Sawaya 416 450 3836

NGB U.K. ⟶ Stirling Paatz 01144 1803869844

MAKING SMALL SCALE DIGESTION A REALITY….