

Valorisation of food waste to biogas

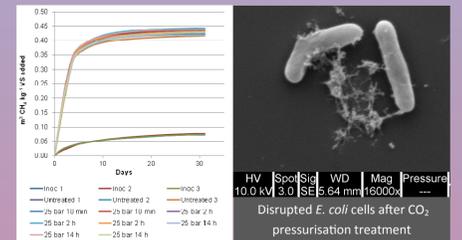
Pre-treatments

Pressurisation with carbon dioxide

- CO₂ is used in the food industry for sterilisation
- The mechanisms of pathogen kill-off are complex and not well understood, but rapid depressurisation could cause cell membranes to rupture
- The same process could rupture fibrous material and potentially increase biogas yields
- If the process is successful, CO₂ could be provided from the biogas produced

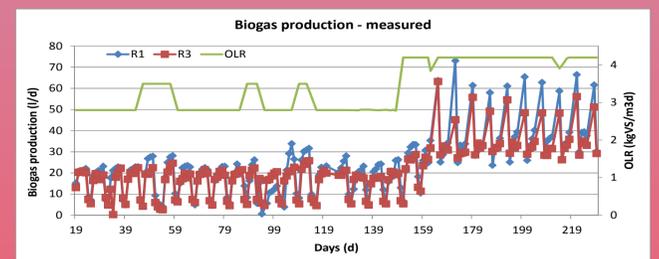


Depressurisation of food waste digestate



Autoclaving

- Heat treatment provides the best means of ensuring the biosecurity of the process, and autoclaving is one way of delivering this
- The research is investigating whether autoclave pre-treatment of the food waste has an effect on biogas production kinetics, biogas yield or process stability
- Laboratory-scale trials are being conducted first, followed by a pilot-scale comparative study



Ammonia Stripping

- When food waste breaks down ammonia release in the digester can be toxic to the methanogenic organisms in the process
- Ammonia can be removed by raising the temperature and/or the pH of the digestate
- Mathematical models using kinetic data from laboratory studies allow us to predict the rate of ammonia removal and help us to design the most suitable type of process
- Recovering ammonia from the process gives a high value fertiliser product

