

The Capraferm® process

From biogas plant to biorefinery – combined production of medium chain fatty acids and biogas

Process & Innovation

The Helmholtz Centre for Environmental Research (UFZ) and the German Biomass Research Centre (DBFZ) have jointly developed a process for producing special chemicals from regional biomass. Based on an anaerobic fermentation process with bacterial mixed cultures, the complex biomass is microbially converted into the target products caproic and caprylic acid. In the following downstream processing the fatty acids are extracted from the fermentation broth and further processed. These acids are used, for example, as additives in lubricants, detergents or feed additives or can be esterified in a further step.

The integration of the production process into existing biogas plants enables a coupled material-energetic biomass utilisation, i.e. production of biogas, fertiliser as well as platform chemicals, thus making the biogas plant more flexible. By using cheap waste materials as starting materials for the production of basic chemicals, the process is environmentally friendly and conserves resources. In addition, disposal costs for organic waste can also be saved.

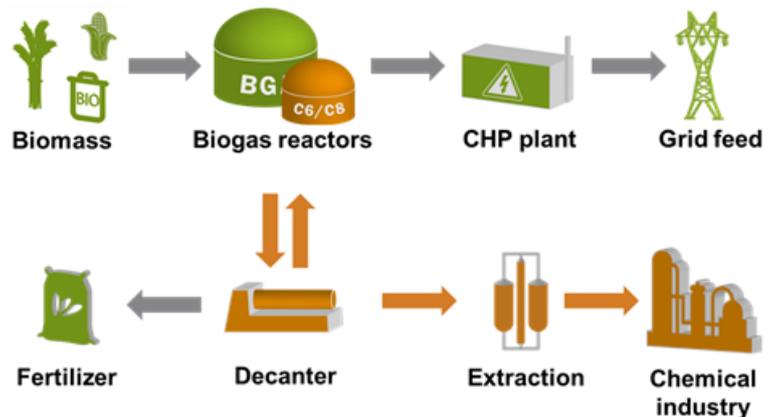
UFZ-Know-how:

- anaerobic fermentation processes
- efficient biomass conversion to carboxylate platform chemicals or methane
- Chain elongation with lactic acid and ethanol, combination with syngas fermentation

UFZ-Expert: Dr. Heike Sträuber

We are looking for:

- Recycling streams to integrate this process
- Know-how for upscaling
- Users of the target products for the different applications to obtain product specifications
- Partner for the construction and operation of a pilot plant for 12 months, e.g. as container solution



Raw materials	Biomasses from energy crops, agroindustrial & municipal organic residues & waste, e.g. bio-waste container, residues from food production
Process control	continuous or batch
Productivity	in the fermentation process <ul style="list-style-type: none"> • caproic acid C6: 1,38 kg m⁻³ d⁻¹ • caprylic acid C8: 0,37 kg m⁻³ d⁻¹ • medium chain fatty acids C6-C8: 1,84 kg m⁻³ d⁻¹
Estimated output	annually 900-1.000 tons C6/C8 acids out of 30.000 tons of maize silage (substrate) using a 1.700 m ³ fermenter
Process costs	approx. 4.200 €/t (1st cost estimation based on TRL 4-5)
Market price	approx. 3.000 – 4.000 €/t - C6/C8 acids

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