

Master Thesis: Fertilizer recovery from ammonia-containing waste streams from meat processing via membrane distillation



AEE INTEC

AEE - Institute for Sustainable Technologies (AEE INTEC) is a non-university research institute founded in 1988. Activities:

- Applied research
- National and international R&D projects
- Cooperation with universities, FHs, other research institutions and industry

AEE INTEC works in the areas of "*solar thermal energy applications*", "*sustainable buildings*", and "*industrial processes and energy systems*".

Research Project

The master thesis is part of the ongoing national research project "**Nutricool**" i.e. **Verfahrensentwicklung zur Herstellung eines biobasierten Düngemittels mit dosierter Nährstofffreisetzung**. AEE INTEC is the project partner; other partners in the project are: Universität für Bodenkultur Wien, Rudolf Großfurtner GmbH, Sonnenerde GmbH and Next Generation Elements GmbH. Meat processing companies generate large amounts of waste that require complex and costly treatment based on national and European hygiene regulations. Usually this type of waste is processed in rendering plants (TKV) which require large amounts of thermal energy. The final products are either burned in waste incineration plants and cement factories or are limitedly used as an animal feed additive. Großfurtner GmbH, one of the largest slaughterhouses in Austria is the first company worldwide that is able to utilize large parts of its accumulated waste through a unique fermentation process in order to generate heat and power. Apart from the main product, which is biogas, also a side product, digestate, is produced during fermentation. Due to the relatively low nutrient density of the digestate - as it usually is the case in waste biogas plants – profitable application seems virtually impossible. An innovative low-temperature process (membrane distillation) is applied to increase the nutrient density and to reduce the water content. In addition to the concentrate, pure water is recovered that is able to replace expensive process water in the facility.

Master Thesis

The tasks of the master thesis include:

- Carrying out (under supervision) laboratory tests with different waste streams
- Membrane fouling characterization and cleaning experiments
- Data treatment and scientific analysis
- Assistance in development of a simulation model for ammonia extraction
- Technoeconomic Assessment of the potential of the technology

Your Profile

- Solution oriented, creative, independent and reliable way of working
- Basic knowledge in thermodynamics (energy & mass balances)
- Basic programming skills (Excel, matlab, etc.)

- Presence required at the institute in Gleisdorf (Austria)

We Provide

- Paid Master's thesis with active involvement in an ongoing research project
- Supervision by experienced staff, competent technical support

Timeframe: 6 months, from September/October 2020

contact and supervision at MUL:

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