

Anaerobic pond treatment of pig farm effluent in New Zealand: exploring opportunities for enhanced performance



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Pig slurry generates environmental challenges like odours, eutrophication of waterways, and the release of greenhouse gases, if inadequately handled. Slurry can be treated in anaerobic pond systems to mitigate environmental impacts, but pond systems often do not operate as intended. Depending on the pig diet, the slurry may contain a high fat content. Fat can cause issues in anaerobic digestion such as foaming and uneven methane production.

The objective of this project is to explore ways to enhance the performance of covered anaerobic ponds to increase methane production, reduce odour emission, and improve digestate quality. The methane production and effluent quality of pond systems on two pig farms will be characterised and compared. One farm uses a fat-rich dairy by-product in the pig feed and reports anaerobic pond issues, while the other farm does not use the fat-rich dairy by-product and reports no issues.

The pond digestate will be analysed for several parameters including fats, phosphorous, nitrogen, and volatile solids. Biogas composition will be monitored and a simple odour survey will be conducted. Bench-scale reactors will be used to assess the biochemical methane potential of the slurries, and to analyse the combined effects of organic loading, temperature, and co-digestion with other agricultural waste.

The research will lead to recommendations for improving performance of anaerobic ponds.

Research / Career Interests

- Environmental sustainability
- Anaerobic digestion
- Biogas
- Waste management
- Sustainable agriculture