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Published in:
proceedings of the 2012 Symposium of The Danish Microbiological Society

Publication date:
2012

[Link back to DTU Orbit](#)

Citation (APA):
Kougias, P., Boe, K., O-Thong, S., & Angelidaki, I. (2012). Influence of microbial composition on foam formation in a manure-based digester. In *proceedings of the 2012 Symposium of The Danish Microbiological Society*

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Influence of microbial composition on foam formation in a manure-based digester

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Foaming is one of the major problems that occasionally occur in the biogas plants, affecting negatively the overall digestion process and results in adverse operational, economical and environmental impacts. The most dominant factors contributing to foaming are organic overloading, feedstock composition and the presence of specific microorganisms. The filamentous microorganisms are known to be the major cause of foaming in sludge digester as they are attached to the gas bubbles and accumulated on the surface of the reactor.

The present case study investigated the microbial composition of one manure-based digester of Lemvig biogas plant that was facing foaming problem, comparing with three non-foaming digesters. The research was focused on the quantitative and qualitative analysis of *Bacteria* and *Archaea* population and on the identification of *Gordonia sp.* The reactor samples were analysed for foaming properties and microbial analysis. The dynamic population of *Bacteria* and *Archaea* were studied by PCR-DGGE method.

The results obtained from this study showed that the composition of *Bacteria* in all reactors was not significantly different indicating that foaming was not caused by *Bacteria*. In contrary, the quantitative and qualitative analysis of *Archaea* revealed significant differences in their population and composition.