Microbial diversity and dynamicity of biogas reactors due to radical changes of feedstock composition - DTU Orbit (26/10/2018)

Microbial diversity and dynamicity of biogas reactors due to radical changes of feedstock composition

The anaerobic digestion process is often inhibited by alteration of substrates and/or organic overload. This study aimed to elucidate changes of microbial ecology in biogas reactors upon radical changes of substrates and to determine their importance to process imbalance. For this reason, continuously fed reactors were disturbed with pulses of proteins, lipids and carbohydrates and the microbial ecology of the reactors were characterized by 16S rRNA gene sequencing before and after the imposed changes. The microbial composition of the three reactors, initially similar, diverged greatly after substrate change. The greatest increase in diversity was observed in the reactor supplemented with carbohydrates and the microbial community became dominated by lactobacilli, while the lowest corresponded to the reactor overfed with proteins, where only Desulfotomaculum showed significant increase. The overall results suggest that feed composition has a decisive impact on the microbial composition of the reactors, and thereby on their performance.

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