

A successful start-up enables acceleration of anaerobic digestion (AD) into steady state. The microbial community influences the AD performance during the start-up. To investigate how microbial communities changed during the start-up, microbial dynamics was analyzed via high-throughput sequencing in this study. The results confirmed that the AD was started up within 25 d. Thermophilic methanogens and bacterial members functioning in hydrolysis, acidogenesis, and syntrophic oxidation became predominant during the start-up stage, reflecting a quick adaption of microorganisms to operating conditions. Such predominance also indicated the great contribution of these members to the fast start-up of AD. Redundancy analysis confirmed that the bacterial abundance significantly correlated with AD conditions. The stable ratio of hydrogenotrophic methanogens to aceticlastic methanogens is also important to maintain the stability of the AD process. This work will be helpful to understand the contribution of microbial community to the start-up of AD.

The adaption of microbial community contributes to fast start-up of the thermophilic anaerobic digestion treating food waste.

