Roles of Methanogens on Volatile Organic Sulfur Compound Production in Anaerobically Digested Wastewater Biosolids

Chen, Y., Higgins, M.J. Maas, N.A., Murthy, S.N. and Toffey, W.E.

ABSTRACT
Land application of wastewater biosolids is both economical and beneficial to resource recycling, which is often the preferred disposal option for wastewater treatment facilities. However, this environmentally friendly practice is at risk due to the odor concerns. Volatile organic sulfur compounds (VOSCs) including methanethiol, dimethyl sulfide, and dimethyl disulfide, have been identified as the major contributors to odor in the biosolids. Methanogens are shown to play a key role in removing VOSCs and reducing odors. Successful colonization of methanogens during biosolids storage is the key to reduced net odor production. Factors influencing the growth of methanogens including centrifuge shearing and temperature showed a strong impact on net odor production. Examination of the microbial communities of both bacteria and archaea indicated a simplified archaeal community in biosolids, which is susceptible to environmental perturbations. Odor control, therefore, can be targeted on the construction of the methanogen population during biosolids storage.