

Bioaugmentation of Anaerobic Digesters with Propionate-Utilizing Cultures for Increased Biomethane Production and Process Stability

Methane is a commercially valuable fuel, as well as synthetic precursor, and can be obtained via microbial fermentation processes. In addition, proper methane production is required for stabilization of municipal, industrial and agricultural wastes via anaerobic digestion. Propionate accumulation is an indicator of process imbalance in organically overloaded anaerobic digesters. Following the overload, methane production can take months to recover. Upset of anaerobic digesters due to an organic overloading is a common problem in the field, and practical methods to reduce recovery time would be beneficial and of commercial value. We have developed a method for overcoming the problem of long recovery times following propionate accumulation. The method employs a process called bioaugmentation, which involves adding an external culture to the digester in order to improved performance. In the invention described, cultures have been developed that, when added to anaerobic digesters, increase methane production and process stability. The addition of select organisms is called "bioaugmentation" since it involves augmenting an existing microbial community with a beneficial, exogenous microbe or group of microbes. The bioaugmentation procedure results in more better digester performance in terms of higher methane production rate and lower effluent SCOD concentration.