

Bioreactor performance in the anaerobic digestion of cattle manure: a review

ABSTRACT

A literature review has been undertaken to investigate the potential of anaerobic digestion for material recovery and energy production from cattle manure. These wastes constitute 8–20% total solid, with a volatile solid content of 70–85%. The biodegradable fractions include about 11% hemicellulose, 26–53% cellulose, and 11% lignin. Anaerobic digestion of cattle manure was studied under various operating conditions using different types of bioreactors and it allows the conversion of 50–75% of organic matter to methane with an organic loading rate of 1–6 g VS/L day. Continuous two-stage configuration involving a first-stage thermophilic reactor and mesophilic second reactor emerges to be superior and the most effective technologies for anaerobic digestion of cattle manure. It was demonstrated that 41% of volatile solids were converted to methane at an organic loading rate of 5.82 g VS/L day. The methane yield was found to be 620 L/kg VS added.

Keyword: Anaerobic digestion; Biomethanization; Bioreactors performance; Cattle manure