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Review

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**Microbial characteristics in anaerobic digestion process of food waste for  
methane production-A review**

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**ABSTRACT**

Food waste (FW) is rich in starch, fat, protein and cellulose. It is easy to decay and brings environmental pollution and other social problems. FW shows a high potential to produce methane by anaerobic digestion (AD) due to its high organic content. However, many inhibitors, such as accumulation of ammonia and volatile fatty acids (VFAs), usually result in inefficient performances and even process failure. Microorganisms play an important role in the process of hydrolysis, acidogenesis, acetogenesis and methanogenesis. This review provided a critical summary of microbial characteristics to obtain connects of microbial community structure with operational conditions at various states of AD, such as mesophilic and thermophilic, wet and dry, success and failure, pretreated or not, lab-scale and full-scale. This article emphasizes that it is necessary to analyze changes and mechanisms of microbial communities in unbalanced system and seek efficiency dynamic succession rules of the dominant microorganisms.

Keywords: Anaerobic digestion; Food waste; Microbial communities; Methane

**1. Introduction**

In recent years, the disposal of food waste (FW) has become an important issue all over the world. According to the literature, the annual production of FW in USA, EU-27, and Japan, reaches to around 26, 50, and 20 million tons, respectively (Zhang, et al., 2017). In China, as reported by China Statistical Yearbook 2011, the yearly output of FW is 60 million tons with the annual increasing rate higher than 10%, but less than 20% of this waste was properly disposed (Zhang, et al., 2015). FW is a high

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