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Review

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Ammonia emission mitigation in food waste composting: a review

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Abstract

Composting is a reliable technology to treat food waste (FW) and produce high quality compost. The ammonia (NH_3) emission accounts for the largest nitrogen loss and leads to various environmental impacts. This review introduced the recent progresses on NH_3 mitigation in FW composting. The basic characteristics of FW from various sources were given. Seven NH_3 emission strategies proven effective in the literature were presented. The links between these strategies and the mechanisms of NH_3 production were addressed. Application of hydrothermally treated C rich substrates, biochar or struvite salts had a broad prospect in FW composting if these strategies were proven cost-effective enough. Regulation of nitrogen assimilation and nitrification using biological additive had the potential to achieve NH_3 mitigation but the existing evidence was not enough. In the end, the future prospects highlighted four research topics that needed further investigation to improve NH_3 mitigation and nitrogen conservation in FW composting.

Keywords

biochar; nitrification; nitrogen; struvite; zeolite

1. Introduction

Food waste (FW) is produced throughout the whole food supply chain (FSC), from agricultural production down to household consumption. The EU-28 discarded 88 million tons of FW in 2012 (Stenmarck *et al.*, 2016). Household is the most important source of FW (53%). The food processing, food service, agricultural production, wholesale and retail represent 19%, 12%, 11% and 5%, respectively. In the U.S., 35 million tons of FW were discarded in municipal solid waste (MSW),

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