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Influence of inoculum on thermophilic anaerobic digestion of food waste

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Abstract: The effects of different inoculum proportion on the thermophilic anaerobic digestion of food waste were studied. The best inoculum proportion was investigated. The effects of six different inoculum proportions on pH, TP concentration, VFA concentration, biogas production and the reduction effects of TS, VS and COD_{Cr} were explored at 55°C. The results showed that the buffer capacity of digestion system was enhanced by adding inoculums. The accumulation cycle of methanogenic bacteria was shortened and the aerogenous fastigium came earlier than before. Moreover, the reduction effect of food waste was promoted. Under the condition of the same materials of 600 grams, the biogas production of the treatment with 480 grams food waste inoculated with 120 grams inoculums (TS ratio 9.47 of food waste and inoculum) was 9359 mL which was larger than that of any other treatment significantly. The reduction effects of TS, VS and COD_{Cr} were also the best, and the reduction rate was 60%, 70% and 39.67%, respectively. However, there was no significant difference in COD_{Cr} reduction compared with CK which was not inoculated.

Key words: food wastes, anaerobic digestion, thermophilic, inoculum