

## Effect of feedstock carbon to nitrogen ratio and organic loading on foaming potential in mesophilic food waste anaerobic digestion

### Abstract

Foaming problem which occurred occasionally during food waste (FW) anaerobic digestion (AD) was investigated with the Malaysian FW by stepwise increase in organic loading (OL) from 0.5 to 7.5 g VS/L. The FW feedstock with carbon to nitrogen (C/N) ratio of 17 was upgraded to C/N ratio of 26 and 30 by mixing with other wastes. The digestion which was carried out at 37 °C in 1-L batch reactors showed that foam formation initiated at OL of 1.5 g VS/L and was further enhanced as OL of feedstock was increased. The digestion foaming reached its maximum at OL of 5.5 g VS/L and did not increase further even when OL was increased to 7.5 g VS/Ld. Increase in the C/N ratio of feedstock significantly enhanced the microbial degradation activity, leading to better removal of foam causing intermediates and reduced foaming in the reactor by up to 60 %.

**Keyword:** Organic loading; Anaerobic digestion; Foaming; Carbon to nitrogen ratio; Biogas methane