

**O 115. THE EFFECT OF VEGETABLE AND FRUIT WASTE ON ANAEROBIC SLUDGE  
DIGESTION PERFORMANCE**

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**ABSTRACT:** Anaerobic sludge digestion process provides energy through stabilization of sewage sludge in municipal wastewater treatment plants. Co-digestion of the sewage sludge fractions with the marketplace wastes (fruit and vegetable) was carried out in semi-continuous laboratory scale bioreactors with three sludge fractions (primary, secondary and mixed) respectively at organic loading rates of 1.65, 0.40 and 1.00 kg VS/m<sup>3</sup>.day, 20 d of hydraulic retention time (HRT) and 35°C. The market wastes were grinded and fed as second substrate to the primary, secondary and mixed sludge receiving anaerobic reactors as vegetable + fruit (50:50%, v: v) and vegetable (100%). When compared to single raw sludge digestion, co-digestion with vegetable + fruit and vegetable, resulted in increased methane production at 60-70% and 35-45%, 55-60% and 40-50% and %for primary, mixed and secondary sludge, respectively. Higher methane increase at vegetable + fruit digestion than the vegetable alone indicated that the fruit waste made a higher contribution as conversion to methane. Co-digestion increased volatile solid removal at 10-11%, 27% and 15% for primary, secondary and mixed sludge, respectively, at vegetable + fruit addition whereas vegetable addition's contribution stayed at 5, 23-24 and 8% of volatile solid removal. Consequently, the addition of feedstock was obtained in descending order for secondary, primary and mixed sludge in terms of its effect on the performance of digestion.

*Keywords: Anaerobic digestion, sewage sludge, energy, organic waste, feedstock, methane production*