Biogas Production from Crop Residue, Fruit and Vegetable Waste via Anaerobic Digestion

Aldabagh, Thara (School: Jeddah Gifted School)

Waste management continues to be an topic of great interest worldwide due to the ever-increasing population and it’s demands. Currently, one of the known technologies is waste to energy recovery that provides multiple benefits. This present work aimed at finding the best combination of municipal waste that will produce the highest rate of energy in the form of biogas. The organic fraction of municipal solid waste mainly consists of fruit and vegetable waste. The degradation study of fruit and vegetable waste along with different combinations of crop residues, indicated better degradation and biogas production as compared to sole fruit and vegetable waste. Different concentrations of crop waste were used for treatment. The 1:4 ratio of fruit to vegetable was proved to be the best with a COD of 17536 mg L-1 and an organic matter removal efficiency of 67.8%. The biogas generation of the fruit and vegetable waste with 20% treated crop residues was also impressive. Accumulative biogas was 124 m3 d-1 and biogas production rate was up to 4.44 m3 d-1. On the other hand, the sole fruit and vegetable waste only showed the maximum biogas production rate of 1.33 m3 d-1 and an accumulative biogas production of 50m3d-1. Therefore, on the basis of results obtained it is concluded that co-digestion of fruit and vegetable waste with crop residues will not only provide better degradation but will also enhance the energy recovery from the waste in terms of biogas production.

Awards Won: