

**Title: "ASSESSMENT OF ENERGY RECOVERY POTENTIAL FROM VEGETABLE/FRUITS WASTE UNDER SUBTROPICAL CLIMATIC CONDITIONS"**

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**Summary**

Firstly, impact of organic waste especially fruit and vegetable waste (FVW) on the environment and major concepts involving anaerobic digestion (AD) are discussed. Then, anaerobic digestion theory and factors affecting AD are presented.

Thirdly, quantification of Fruit and vegetable market waste (FVMW) and the characteristics and potential of FVW for subtropical climatic condition are discussed. Then a detailed experimental methodology, process parameter selection, waste preparation, monitoring and experimental procedures, design of experiments, analytical procedures for various stages of study are presented and the results of the FVW Characterization, acetogenesis batch studies, combined acetogenesis and methanogenesis, continuous studies are discussed.

Lastly, general conclusion and overall conclusions of the study are presented along with recommendations and scope for further studies. The major findings of the study are,

1. FVMW could be utilized as a single substrate for energy recovery through AD.
2. During acetogenesis, VFA increased with the increasing HRT, OLR and temperature.
3. Grade II  $\text{Fe}_3\text{O}_4$  nanomaterial waste could not prove to be a catalyst.
4. For subtropical climatic conditions methane yield depends more on HRT and OLR rather than temperature. The optimum HRT and OLR of 35 days and 6gCOD/l.d or 1 gVS/l.d respectively is suggested for AD of FVW.

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