

The Effect of Various Parameters on Sustainable Biogas Production

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Abstract: *This research study aimed to examine the effect of various parameters on sustainable biogas production through the anaerobic digestion of organic matter. A laboratory-scale biogas digester was used to evaluate the impact of different feedstock compositions, temperatures, pH levels, retention times, mixing and agitation, inoculum, and operating conditions on biogas production efficiency and yield. Biogas yield, quality, and composition were measured and analyzed to identify the optimal conditions for sustainable biogas production. The results of the study indicated that feedstock composition, temperature, pH, retention time, mixing and agitation, inoculum, and operating conditions all had significant impacts on biogas production efficiency and yield. Specifically, feedstock composition and retention time were found to be the most critical factors affecting biogas production. A high carbon-to-nitrogen (C:N) ratio in the feedstock and longer retention times were associated with higher biogas yields. The findings of this study have important implications for the development of more efficient and sustainable biogas production systems. By optimizing the various parameters involved in biogas production, it is possible to improve the efficiency and yield of biogas production, while minimizing environmental impact. This research contributes to the growing body of knowledge on sustainable energy generation and waste management, and highlights the potential of biogas production as a renewable energy source.*

Keywords: Biogas, Sustainable, Feedstock composition

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