



# Potential of biogas production from manure of dairy cattle fed -on natural soil supplement rich in iron under batch and semi continuous anaerobic digestion

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## Abstract:

This study provides a novel method for improving the anaerobic digestion (AD) of Holstein dairy manure (HDM) by the direct addition of Mineraso (MnS), a natural soil-derived supplement, to the feed of Holstein dairy cattle (HDC). MnS is chiefly composed of approximately 69.08%  $\text{Fe}_3\text{O}_4$  and was supplemented at rates of 0 (F1), 25 (F2), and 50 (F3) g/head of HDC/d for two months. The HDM was then examined for non-absorbed iron prior to the batch and semi-continuous bench AD experiments. The results revealed that MnS enhanced  $\text{CH}_4$  generation in F2 and F3 by 25% and 42%, respectively, in the batch experiments compared to that of F1. Additionally, the gas yield improved in F2 and F3 by 45% and 66%, respectively, over the control after 7 d in the bench experiments. Therefore, supplementing animals with MnS represents a sustainable and economic approach to enhancing  $\text{CH}_4$  yields.

## Keywords:

Anaerobic digestion Iron supplement Biogas Manure Natural mineral

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