

Reducing Toxic Gas Releases from Dairy Manure for Improved Safety

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Abstract

Toxic levels of hydrogen sulfide (H₂S) gas released from dairy manure storages have imposed risks to animal and human health. Gypsum (calcium sulfate) is a valued bedding material for cattle but has contributed to the excessive H₂S emissions. This study aims to assess the effect of iron oxide as a promising additive to dairy manure storages on mitigating H₂S releases. Four treatments with decreasing dosages of iron oxide will be applied to gypsum-laden dairy manure. The effectiveness of iron oxide in reducing H₂S emissions will be quantified using a highly accurate gas analyzer so that an economically effective dosage of iron oxide will be identified from this study. This research will also deliver an improved understanding of mechanisms of manure gas emissions. Critical evidence from this study will guide industry, government agency and farm manager actions in reducing toxic gaseous pollutants to improve human health and animal welfare surrounding manure storages.