

87. 養豬場沼氣收集發電減碳效益評估

歐修汶⁽¹⁾ 張筱瑜⁽²⁾ 劉威志⁽¹⁾⁽²⁾⁽¹⁾農業部畜產試驗所 ⁽²⁾國立中山大學環境工程研究所

本研究旨在比較不同養豬場之廢水處理場收集沼氣發電時之減碳效益，期能使業者增加沼氣收集破壞以減少溫室氣體排放。減碳專案評估地點是在 2 座 (A 與 B) 畜牧場之廢水處理場，其飼養量各為 1,950 與 2,500 頭豬。收集廢水場用電量、廢水產生量及水質資料。計算廢水場基線活動 (厭氧處理、污泥處理及管線洩漏等之沼氣量) 與從事專案活動 (沼氣發電) 之碳排放量，基線活動減去專案活動即廢水場從事專案活動之減碳效益。試驗結果顯示，A 牧場厭氧處理進流平均 COD 為 8,979 mg/L，COD 去除率為 87.4%，實際平均廢水量為 8.29 立方米/天，其廢水場減碳量 84.78 噸 CO₂e/年。B 牧場厭氧處理進流 COD 為 6,307 mg/L，COD 去除率為 83.6%，實際平均廢水量為 14.4 立方米/天，其廢水場減碳量 102 噸 CO₂e/年。厭氧處理單元進流廢水之 COD 濃度、COD 去除率與廢水量等因素對該牧場減碳效益影響很大。

關鍵語：廢水處理場、沼氣發電、減碳效益

Carbon reduction benefit assessment of biogas collection for power generation at pig farms

H. W. Ou⁽¹⁾, H. Y. Chang⁽²⁾ and W. Z. Liu⁽¹⁾⁽²⁾⁽¹⁾Taiwan Livestock Research Institute, Ministry of Agriculture⁽²⁾Institute of Environmental Engineering, National Sun Yat-sen University

The aim of this research is to compare the carbon reduction benefits when collecting biogas for power generation in wastewater treatment facilities at different pig farms, with the aim of encouraging farmers to increase biogas reusing to reduce greenhouse gas emissions. The carbon reduction project assessment was conducted at two livestock farms (A and B). Collecting data on electricity consumption, wastewater yield, and wastewater quality analysis at the facility. Calculating the carbon emissions for both baseline activities and project activities, with the difference between the two representing the carbon reduction benefit. The results indicate that at Farm A, the average influent COD (Chemical oxygen demand) before anaerobic treatment was 8,979 mg/L, with a COD removal rate of 87.4%. The wastewater volume was 8.29 CMD, resulting in a carbon reduction of 84.78 tons CO₂e/y at the facility. At Farm B, the influent COD before anaerobic treatment was 6,307 mg/L, with a COD removal rate of 83.6%. The wastewater volume was 14.4 CMD, resulting in a carbon reduction of 102 tons CO₂e/y at the facility. The influent COD, COD removal rate, and wastewater volume have a significant impact on the carbon reduction benefits.

Key Words: Wastewater treatment facilities, Biogas power generation, Carbon reduction benefit