

GASEOUS EMISSIONS FROM MANURE AS AFFECTED BY MICROBIAL-BASED ADDITIVE AND TEMPERATURE

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Abstract. This experiment was conducted to investigate ammonia (NH₃), methane (CH₄), hydrogen sulfide (H₂S), carbon dioxide (CO₂), carbon monoxide (CO) and nitric oxide (NO) emissions during the storage of untreated pig and cattle liquid manure at different temperatures and to assess the effect of the microbial-based additive for the volatilization of these gasses.

Dynamic chamber method and infrared or electrochemical detection were employed using laboratory simulation to analyze the gas emissions from pig and cattle liquid manure. Twenty-four buckets were filled with fresh manure. To half of the buckets the microbial-based additive was added. The samples were stored for a period of 29 days at 5±1, 15±1 and 25±1 °C temperatures.

The present study showed that under the same storage conditions, the use of the additive did not change the manure characteristics and did not result in significant differences between the emission rate of measured gases from the untreated manure and from manure+additive for both pig and cattle. Nevertheless, the use of the microbial-based additive has a tendency to reduce ammonia emission from pig manure, contrariwise, it has the potential to increase the emissions of CH₄, CO and NO of pig and cattle manure. In this experiment, the temperature and the type of manure were the main factors significantly related to the emission rates of investigated gases.

Keywords: gas emission, additive, manure, pig, cattle