Anaerobic digestion potential to reduce livestock waste environmental impact: a case study in Basilicata Region (Italy)

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Abstract

In recent years, following the European regulations on the production of electricity and heat from biogas, initiatives aimed at creating anaerobic digestion plants using agricultural and livestock wastes are increasing. There are many advantages associated with the production of biogas, among those the decrease of environmental pollution due to animal wastes and reducing odours associated with them. Then from anaerobic treatment of waste derives digested biomass that could be directly used for fertilization.

In this paper, authors, focusing their attention on a small area suitable for livestock production, show the results, in terms of both electricity and thermal energy, deriving from the exploitation of cow waste in a biogas production plant. The study area is located in the north part of Basilicata Region (South Italy), and considers about 500 livestock units for a daily production of about 28 cubic meters of manure and 16 cubic meters of sewage.

Results show that from biogas is possible to obtain an electrical power equal to 86 kWe, and a thermal power equal to 110 kWt.

Furthermore, digestate from biogas plants is rich in plant nutrients and has excellent fertiliser qualities so it could be used as a sustainable alternative to mineral fertilisers.

Keywords*: biogas, manure, sewage, digestate, fertiliser*