

# METHANE FERMENTATION OF CHICKEN MANURE UNDER MESOPHILIC CONDITIONS AND PRETREATMENT FOR ENHANCING BIOGAS PRODUCTION

**Izabela Konkol, G Solowski and A Cenian**

Institute of Fluid Flow Machinery-Polish academy of Sciences, Poland

Poland is the leader in poultry farming in Europe. It was estimated that in 2015, the total production of poultry (broilers, turkeys, laying hens) was 950 million birds, which resulted in 5 million tonnes of manure, biowaste which is rich in important biogens-phosphorus and nitrogen. High nitrogen content in this kind of substrates, mainly in the form of uric acids and proteins may lead to inhibition of fermentation process. Free ammonia nitrogen accumulation may cause instability of the fermentation process, resulting in a decreased methane and biogas production or even in complete inhibition of digestion process. Many different methods have been proposed that can solve this problem, such as dilution of the substrate, pH and C: N ratio control, additives or acclimation of the microflora. In our study, the removal of nutrients from chicken manure was investigated by water extraction in a given temperature range. The purpose of the research was to determine an increase in methane production from chicken manure after simple water pre-treatment, by analysing dynamics of the process and biogas efficiency. Anaerobic digestion of chicken manure after water extraction is a promising way for increasing production of biogas and methane as compared to raw chicken manure. Water extraction successfully increased C: N ratio from 10 to 20-27. About 16-38% and 16-45% more methane and biogas was produced respectively from pre-treated than from raw chicken manure.

## Biography

Izabela Konkol was graduated from the Faculty of Chemistry, Gdansk University of Technology and obtained a Master of Science degree. Currently, she is continuing her Doctoral Studies; at the same time, she is an employee at the Institute of Fluid-Flow Machinery.

[izabela.konkol@imp.gda.pl](mailto:izabela.konkol@imp.gda.pl)