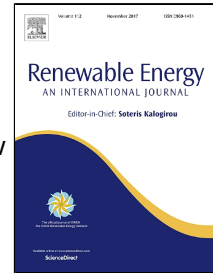


Accepted Manuscript

Modeling and optimization of biogas production from cow manure and maize straw using an Adaptive Neuro-Fuzzy Inference System

Samira Zareei, Jalal Khodaei



PII: S0960-1481(17)30664-X
DOI: 10.1016/j.renene.2017.07.050
Reference: RENE 9025
To appear in: *Renewable Energy*
Received Date: 20 October 2016
Revised Date: 15 May 2017
Accepted Date: 10 July 2017

Please cite this article as: Samira Zareei, Jalal Khodaei, Modeling and optimization of biogas production from cow manure and maize straw using an Adaptive Neuro-Fuzzy Inference System, *Renewable Energy* (2017), doi: 10.1016/j.renene.2017.07.050

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **Modeling and optimization of biogas production from cow manure and maize straw**
2 **using an Adaptive Neuro-Fuzzy Inference System**

3
4 **Samira Zareei^{a,*}, Jalal Khodaei^a**

5
6 ^a Department of Biosystems Engineering, University of Kurdistan, Sanandaj, Iran, Postal
7 code: 66177-15177, Tel: +98-33627723

8 *Corresponding author: s.zareei@uok.ac.ir
9

10 **Abstract**

11 This study was focused on the prediction and optimization of biogas production from cow
12 manure with maize straw under various total solid content (TS), Carbon to Nitrogen (C/N)
13 ratio and stirring intensity. This research used full-scale (1200 L) batch reactor under
14 mesophilic condition. An adaptive neuro-fuzzy interference system (ANFIS) was utilized to
15 predict and optimize biogas production from anaerobic digestion. C/N ratio, TS and stirring
16 intensity of substrates, each of them in three levels, were considered as input variables and
17 biogas production was regarded as the output variable of the model. The coefficient of
18 determination (R^2) between observed and predicted biogas production values was 0.99
19 which showed good match and accuracy of the model. Highest biogas production was
20 achieved from C/N ratio 26.76, TS 9% and moderate stirring. Biogas production increased
21 about 8% with optimal conditions suggested by the ANFIS model.

22
23 **Keywords**

24 Anaerobic digestion, livestock manure, stirring, total solid content

25 **1. Introduction**

26 Biogas is a renewable energy source that can be obtained from digestion of organic
27 waste in the absence of oxygen. Several studies were carried out on many aspects of biogas
28 production, processing and utilization [1]. Biogas production is affected by many

Download English Version:

<https://daneshyari.com/en/article/4926161>

Download Persian Version:

<https://daneshyari.com/article/4926161>

[Daneshyari.com](https://daneshyari.com)