

Accepted Manuscript

Anaerobic Digestion of Pig and Dairy Manure under Photo-Dark Fermentation Condition

Dongxue Yin, Wei Liu, Ningning Zhai, Gaihe Yang, Xiaojiao Wang, Yongzhong Feng, Guangxin Ren

PII: S0960-8524(14)00696-8

DOI: <http://dx.doi.org/10.1016/j.biortech.2014.05.037>

Reference: BITE 13445

To appear in: *Bioresource Technology*

Received Date: 17 January 2014

Revised Date: 5 May 2014

Accepted Date: 7 May 2014

Please cite this article as: Yin, D., Liu, W., Zhai, N., Yang, G., Wang, X., Feng, Y., Ren, G., Anaerobic Digestion of Pig and Dairy Manure under Photo-Dark Fermentation Condition, *Bioresource Technology* (2014), doi: <http://dx.doi.org/10.1016/j.biortech.2014.05.037>

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 Anaerobic Digestion of Pig and Dairy Manure under Photo-Dark

2 Fermentation Condition

3 Dongxue Yin,^{1,2} Wei Liu,^{1,2} Ningning Zhai,^{2,3} Gaihe Yang,^{2,3} Xiaojiao Wang,^{2,3} Yongzhong Feng,^{2,3} Guangxin Ren^{2,3}

4 ¹ College of Forestry, Northwest A&F University, Yangling, Shaanxi Province 712100, China

5 ² Research Center for Recycling Agricultural Engineering Technology of Shaanxi Province, Yangling, Shaanxi
6 Province 712100, China

7 ³ College of Agronomy, Northwest A&F University, Yangling, Shaanxi Province 712100, China

8 Corresponding author Address: College of Agronomy, No. 95 Mailbox, North Campus of Northwest A&F University,
9 Yangling, Shaanxi 712100, China. Tel.: +8615902916021; fax: +86 029 87092265.

10 E-mail address: ygh@nwsuaf.edu.cn (G. Yang).

11 A B S T R A C T

12 Anaerobic digestion (AD) with livestock manure is a promising way for biogas production. This work
13 presents the influence of photo-dark fermentation on biogas production of pig manure (PM) and dairy
14 manure (DM). Four sets were conducted with temperature $35\pm 2^{\circ}\text{C}$ and total solid concentrations 8%:
15 PM_1 and DM_1 in transparent reactor under sunlight for photo-dark fermentation, and PM_2 and DM_2 in
16 none-transparent reactor for dark fermentation. DM_2 had the best cumulative biogas production (CBP)
17 of 15447.5mL, followed by PM_1 (15020mL) with stable pH and low total ammonium nitrogen (TAN)
18 concentration (1384.99 mg/L), and DM_1 and PM_2 . The CBP of DM_2 was 5.77 times as much as PM_2 .
19 The relationship between CBP and four factors including volatile fatty acid (VFA), TAN, total
20 alkalinity and pH was analyzed. pH gained the maximum determination coefficient with the CBP
21 among all sets and total alkalinity showed negative correlation with CBP of PM_1 and DM_1 .

22 **Key words:** Anaerobic digestion Pig manure Dairy manure Photo-dark fermentation Path analysis

23 1. Introduction

24 Along with the development of intensive feeding in China, the livestock manure increases fast
25 with an annual production rate of 406 million tons in 2013 (Jin et al., 2013). Livestock manure waste is
26 a significant source of fecal pollution and serious sanitary problems due to its high chemical oxygen
27 demand, high concentrations of suspended solids, and nitrogen and phosphorus compounds (Song et

Download English Version:

<https://daneshyari.com/en/article/7076777>

Download Persian Version:

<https://daneshyari.com/article/7076777>

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