

Centre de Recherche Public
Gabriel Lippmann

F. Mayer
A. Noo
G. Sinnaeve
P. Dardenne
L. Hoffmann
G. Foucart
J. Flammang
P. Gerin
P. Delfosse

Evaluation of the prediction of biogas production from maize silages with Near Infrared Spectroscopy (NIRS)

Centre de Recherche Public – Gabriel Lippmann
Luxembourg

mayer@lippmann.lu

Progress in Biogas II, University of Hohenheim, Germany, 30-31 March 2011

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Introduction

2 L

Biogas (and/or BMP) measurements

100 mL

Couple of weeks !

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Introduction

NIRS is successfully used for various applications: nutritive value, quality & authenticity, process controlling & monitoring...

Advantages: easy, fast, non-destructive technique.

Light Source

Monochromator (800-2500 nm)

Sample

Detector

Data

Processor

Data treatments

Chemometrics

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Introduction

Preferred energy crop: maize silages

Organic content

Various methane yields

Varieties
Cultural practices
Maturity stages
Seasons

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Material and methods

Samples

6 fields
2008-2009

→ 193 different maize samples

Maize silages

21 varieties
3 harvesting dates
for 4 specific varieties (FAO Index 240-340)

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Material and methods

Anaerobic digestion (VDI-4630)

2 L

Gas volume (mL)

Curve fitting

$G(t) = \frac{A}{1 + \left(\frac{B}{t}\right)^c}$ (mL.gFM⁻¹)

Inoculum: Sludge from AD of a sewage treatment plant

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