Wastes of banana’s lignocellulosic biomass: a sustainable and renewable source of biogas production

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INTRODUCTION

As a renewable energy source in a context of sustainable development, discarded banana’s lignocellulosic biomass (balicebiom) could be used efficiently to produce biogas in general and CH₄ in particular.

RESULTS 1

% of balicebiom DW:  11 11.5 17 40.5 7 11

C/N:  45 57 130 18 28 21

m³ CH₄/ton DW:  150 140 98 162 144

RESULTS 2

Biogas production during 188 d

RESULTS 3

VFA concentrations after 14 d

<table>
<thead>
<tr>
<th>VFA</th>
<th>Konjac</th>
<th>Propionate</th>
<th>Butyrate</th>
<th>Glucose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration (g/L)</td>
<td>8 7 6 5 4 3 2 1 0</td>
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<td></td>
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</tbody>
</table>

CONCLUSIONS

Our results show that:
- An efficient transformation of balicebiom into a clean energy vector, biomethane is possible.
- An agro-industrial banana producing company such as CDC-Del Monte in Cameroon could generate an important income from this energy (about 10 million kWh which would be worth 0.8–1.6 million € in the current market).
- Further studies need to be performed to improve the biogas productivity.
- Pre-treatments and co-biomethanation of all the six MPs studied in this work need to be investigated in order to reduce the digestion time and to optimize the production of CH₄.