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Influence of temperature and hydraulic retention on the production of volatile fatty acids during anaerobic fermentation of cow manure and maize silage

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1 **Influence of temperature and hydraulic retention on the production of volatile fatty acids**  
2 **during anaerobic fermentation of cow manure and maize silage**

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11  
12 **Abstract**

13 The aim of this study was to verify the efficiency of a separate hydrolysis step by testing different  
14 working temperatures (37° to 55 °C) and hydraulic retention times (two, four and six days) and by  
15 evaluating readily biodegradable carbon production. The fermentation products included primarily  
16 acetic, propionic and butyric acids. These acids can be easily converted into biogas or can be  
17 recovered in a biorefinery approach, for example, to produce polyhydroxyalkanoates. The optimal  
18 condition was found by applying an organic loading rate of 17.9 gTVS m<sup>-3</sup> with a four-day  
19 retention time at 37°C for an acidification yield of 183.2 gCOD<sub>VFA</sub> kgVS<sub>fed</sub><sup>-1</sup>.

20  
21 **Keywords**

22 fermentation, anaerobic digestion, maize silage, cow manure, volatile fatty acid.

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