BETTER FINANCIAL CONDITIONS FOR THE ANIMAL FARMING BY THE ENERGETICAL UTILIZATION OF THE ORGANIC WASTE

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Summary: *This research enterprise proposes summary of a long series of a lot of biogas experiments, dealing with the co-fermentation of liquid pig slurry as a basic substance and different agricultural organic wastes, main and by-products. The utilization of these materials as an energy source spells large income for animal farming, saving the replacement of plant nutrition utilization of bio-manure, growing the yield of the plant production, biodegradation the manure which causes a huge environmental load. Because of the success of sustainable energy succes traceable to the local situation it is important to do examinations to try the disposable organic materials in the rate of the formation in advance. The measurements were running among real biogas plant properties, with mesophyll technology, continuous deconstruction process. This is almost industrial category.*

Key words*: environment friendly agriculture, green technology, growing income*

INTRODUCTION

It was written in my scientific and bibliography resources[1,2], that the different features of the methane development in the biogas plants mostly dependent on the basic material liquid manure, the aggregates, and the properties of the utilized biodegradation process. Our examinations proved the yield increasing influence[4,6] of the farming major and secondary products and rubbish because of the little organic material substance of the diluted pig slurry. "It may be hypothesized, that these additives and the technological parameters of the biogas production influence on a favourable direction the properties of the fermented manure and through this the opportunities of the recirculation"[1]

The purpose of my experiments aimed the rising of ratio of the renewable energy sources utilization is the enhancement the methane ratio deriving [3]from the different organic additives, to grow of the intensity of the releasing, to produce fix gas constitution. Changing the organic materials polluting the circumambiency ingenuous is the indirect goal of the utilization of the technology[3]. "The biogas developing greenhouse impact with big methane content means concentrated environmental load and source of danger and on the other hand unutilized energy source in on a farming area where the use of the exterior power sources is considerable anyway"[1]. While principle from below, the relatively little energy content of the biomass in the view of the transportation expense from above limits the firm concentration [2]. Because of this it is expedient to examine the energetic utilization of all possible organic waste at least with laboratory or half firm methods.

MATERIALS AND METHODS

I had opportunity to join to a partner institute in a common resource project, where there was available a semi-automatic laboratory system, simulating the regular operating conditions, providing similar circumstances suitable the releasing process of the biogas, adjust the affective properties and all of necessary examinations of typical data[5,7]. The liquid pig slurry was used during the biogas production experiments as a basic material.

The minor details of industrial major and secondary products and wastes appropriate for the examination of the biogas production[6]: dry material, organic material, nitrogen rate, C:N ratio, specific gas formation.

Table 1.

Laboratory equipment utilized during the experiments

serial number	measured parameter	device	method	comment
1.	Fermenter temperature(°C)	digital thermometer		once a day, at the same time
2.	gas yield (dm^3)	gas meter		
3.	gas content %	GA45 gas analyser		
4.	conductivity (mS/cm)	Hydrolab	electrometric	once a day, at the same time
5.	solutedoxygen(mg/l)			
6.	pH			
7.	salination (PSS)			
8.	Redoxpotential (mV)			
9.	BOD5 (mg/l)	Oxi Top 110	pressure dropping	from samples selected based on professional viewpoints
10.	COD (mg/l)	NANOCOLOR	photometry	
11.	dry matter content	drying cupboard		daily, at the same time

The method of the digesting experiments, the steps of the experiments are:

- Filling up of laboratory digesters,
- preparing of the treatment composition
- Sampling.

Table2.

Method of digesting experiments

serial number	1.	2.	3.	4.
period of the process	stabilization	uploading period with fresh substrate	running-up period	comparativ experiments
treatment		running-up period with fresh substance		
duration time	7 days	14 days	21 days	21 days

Hydraulic retention time ~20days

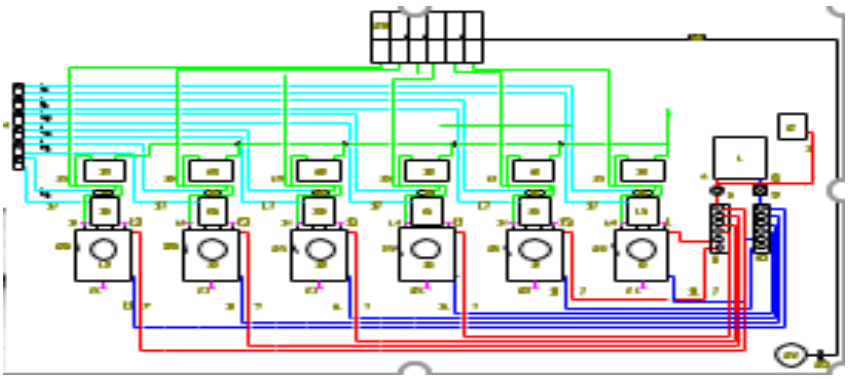

Figure 1. Laboratory equipment layout for biogas experiments

Figure 2. Laboratory for biogas yield measurements

RESEARCH RESULTS

Quantitativ and qualitative evaluation of biogas experiments with biofuel main and by-products additives

Table 3.

Reactors, treatment liquid pig slurry (4% dmc.) +additives	Digester No.	load (slurry) V/V %/day	additive dmc. (g/d)	average biogas yield (dm^3/d)	met-hane con-tent (%)	specific biogas yield /methane prod. (dm^3/dm^3/d)	
control	IV/1.	5		41,83	57,0	0,84	0,48
sunflower pellet	IV/2.	5	100	72,56	57,6	1,45	0,84
corn pomace	IV/3.	5	100	74,55	54,5	1,49	0,81
sunflower pellet, +bac. treatment	IV/4.	5	100	58,13	54.5	1,16	0,63
corn pomace +bacterium	IV/5.	5	100	82,89	58,0	1,66	0,96

I examined the impact of the effect of the addition of bio-fuel production by-products in the case of liquid pig slurry fermentation, because the utilization of these fodders is not always provided as a safety business[8,10].

The sunflower pellet without bacteria treatment is highly improved the biogas releasing(72,56 dm^3/d>>41,83 dm^3/d) and the methane content didn't decreased, as general, but increased(57,6%57,0%). There is only one problem because of the price of the sunflower pellet, as an valuable and healthy product. The bacteria treatment didn't caused increasing of the yield, probably it were not the perfect species[9,11].

The corn pomace addition produced the biggest growing of the biogas and methane production(74,55 dm^3/d>>41,83 dm^3/d). During the hugh amount of biogas measurements it was very special the increasing of the growing of the methane content, particulary probable because of the perfectly chosen bactery species. The compaction inclined corn

pomace can lift the density of the thin liquid pig manure[7,13]. Well preparing(mixing) the corn pomace we can improve the biogas yield more than 20%[14,15].

CONCLUSIONS

The liquid pid dung based biogas forming dependent property from the co-fermentation of other wastes among the agricultural farming major and secondary products is succesful, and used technological process in the European Union[11,12], as the result of this biogas and bio-fertilizer is arised. The different quantitatve and qualitative properties of the primary commodities and aggregates, the properties of the utilized biodegradation process and the biogas releasing are strongly related.

To compare the results of the biogas production measurements I can found, that the addition of the press residue bio-fuel byproducts increase the biogas yield of the liquiform pig slurry, and rising of these is deliberately greater, than the reduction of the methane rate. The explonation of the connection between the relation of the ripeness rate and the value of the carbon hydrates amount of the different species demands more researches.

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