

Earth sciences

BIOSLURRY USE AND COMPOSTING







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Feedstocks

WHAT IS ANAEROBIC DIGESTION?

Common feedstocks

Animal manures – cattle, pigs, chickens Field residues – stover, stalks, leaves Processing waste – rice bran, coffee pulp / mucilage Household waste – vegetables, food, cutting rests Slaughtering waste – hides, intestines, blood Toilet waste



Sanitation					
Bacteria	AD system		Untreated slurry syster		
	35 °C (days)	53 ºC (days)	18–21 °C (weeks)	6–15 °C (weeks)	
Salmonella typhimurium	2.4	0.7	2.0	5.9	
Salmonella dublin	2.1	0.6	-	-	
Escherichia coli	1.8	0.4	2.0	8.8	
Staphylococcus aureus	0.9	0.5	0.9	7.1	
Coliform bacteria	3.1	-	2.1	9.3	
Group D streptococci	7.1	-	5.7	21.4	
Streptococcus faecalis	2.0	1.0	-	-	



Theoretical yield

- Proteins
- Energy content
- Polymers (sugars, cellulosis)
- Energy contentLignin
- Other materials

 Manures 	Substrate	Characteristics	Dry matter content (DM)	Organic dry matter content (oDM)	Biogas yield	Methan share
Crop residues			% of fresh matter	% of dry matter		
Household waste	Poultry dung	depending on the	40	75	500	55
 Processing waste 	Cattle dung	attle dung little stored	25	85	450	55
	Cattle manure	incl. fodder residues	8,5	80	380	55
	Pig manure		6	80	420	60





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Bioslurry composition varies strongly

- Species and age of the animal from which dung was drawn
- Quality of water used in mixing the dung
- Type of digester
- Type of Feed and Feeding rate of the animals
- Use of urine/not along the dung
- Storage, treatment and application to the field
- Environmental factors

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Product	Unit	Value
Total Solids	% of Fresh Matter	2-46
Volatile Solids	% of Total Solids	39 – 75
pH		7-9
N Total	% of Dry Matter	3-14
idem	% of Fresh Matter	0.12-1.5
Nitrogen NH ₄	% of total N	35-81
Total phosphorus	% of Dry Matter	0.2-0.35
idem	% of Fresh Matter	0.04-0.26
Total potassium	% of Dry Matter	0.19-4.3
idem	% of Fresh Matter	0.12-1.15
Source: adapted from Nkoa	(2013: cattle manure)	

Digestate from coffee pulp	Unit	Value	
Н		6.8	
I Total	mg/l	70	7
litrogen NH4	mg/l	17	
Potassium (K ₂ O)	mg/l	314	
Phosphorous (P ₂ O ₅)	mg/l	20	
Aagnesium (Mg)	mg/l	7	1



Feedstocks and	d digestate o	quality	and out	
	Effect	Liquid manure	Crop residues,	Dedicated crops
	Manure handling	+	+++	+++
Adding residues:	NH4+/total N ratio	+	+++	+++
	pH	++	++	++
- Better manure handling	Nitrogen availability	0	++	++
Ŭ	Nitrogen use efficiency	0+	+++	-
- Increased nitrogen availability	Phorphorus availability	0	0	0
	Heavy metal availability	0 -	0 -	0 -
 Improved nitrogen use efficiency 	Crop growth	0	++	+++
- Good for crop growth				





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Thank you	
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