Baltic Manure
Baltic Forum for Innovative Technologies for Sustainable Manure Management

Recommendations for Biogas

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Content

• Baltic Manure results & Recommendations from 2013
  – http://www.inbiom.dk/Files//Files/Publikationer/Projektbrochure_baltic_manure_2013.pdf
• Danish biogas results from 2016 on manure co-substrates
Baltic Manure recommendations and consequences reflect that manure should be handled in a sustainable cycle. Make use of all manure values (nutrients and energy) with low external input and output.
Top ten recommendations…

1. Optimize animal feeding and reduce water use/spillage
2. Ensure sufficient capacity of covered, cold storage facilities
3. Analyse nutrient content of manure and
   – dose manure precisely to the needs of the crops and at the right time
4. Inject, incorporate immediately or acidify the manure when applying in the field
5. Generate energy from the manure if possible
   – biogas and sustainable co-substrates
6. Agree on norms and quality criteria for manure fertilizer products of different origin
7. Deploy a set of maximum P-limit at the EU level, depending of soil and crops needs
8. Change the status of certified composted or digestated manure from a waste into marketable products
9. Ensure that advisors and farmers are educated in manure handling technologies and related economic calculations
10. Remember that by consuming meat and dairy products one produces manure.
Manure energy

• Biogas is a key recommendation
  – Thermic gasification of fibers can be possible.
• The digestate
  – should be post-digested,
  – stored in covered storages and
  – applied to the fields with proper methods and timing
Co-substrates

- Co-substrates
  - chosen according to sustainability
  - solid manure/deep litter
  - agricultural and societal wastes and by-products
  - maize is not recommended.
Anything New from Baltic Manure?

• Soy bean import is perhaps more important for the Baltic Sea pollution than manure handling…..

• Future livestock might be insect larvae, fish and rabbits!
Danish manure based biogas

Methane-potentials
Mio. Nm3 methan/yr

- Straw
- Slurry
- Organic waste
- Deep Litter
- Meadow grass
- Roetop
- Fast mæg
- Haveparkafald
- Greftekanter
- Catch crops
- Maize
- Sugar beet
- Grass

2012
2020
Danish results/recommendations 2016

- Methane collection in pre- and mixer tanks is recommended
- Methane leakages should be stopped
- Need for innovation to remove sand (cattle and cast seaweed, beets)
- Ensure 100% sale of gas (no flaring)
- Inoculum is important for straw digestion (adapted culture)
- Load/unload and pretreat biomass in closed buildings with air cleaning
- Increase DM content – especially hay & straw
- Longer Hydraulic retention time is recommended, especially for straw (> 35 days-100 days)
  - Pretreatment of solid co-substrates important with < 35 days HRT
- Pretreatment of straw important for mixing
Performance, 15 Danish biogas plants

- Methane production
- Non-digested methane
- Total methane (right axis)

Pr ton input (left)
Pretreatment of straw

Treated straw in water after 30 min

Treated straw in water after 5 days
Figur 67. Gaspotentiale L CH₄/kg VS før og efter forbehandling af halm. For Hüningen indgår kun det ubehandlede halm, da det ikke var muligt at behandle halm med udstyret, uden tilsætning af betydelige mængder majens-silage.
Remarks

- Energy consumption for speeding up versus HRT
- Tear and wear/ OPEX
- Mixing within tank/ floating layer/ DM max
Samsoe Feasibility study
Feed proteins
Fertilizers
Nutrient recycling (N P C)
More Organic farming
New crops
Paludi-culture
Aqua-culture

Biogas2020
-Sammen skaber vi en skandinavisk biogasplatform
Thank you for your attention!

• And welcome to Samsoe! 😊