



Why should we have a Digestate Quality Assurance Scheme?

Whole digestate, separated liquor, separated fibre

What are the outlets for digestate?

- Agricultural & horticultural – mustn't contaminate soil
 - bring positive benefit
 - food grown must be safe
- Sports grounds – must be safe – sharps & health
- Post treatment wwtp – expensive & difficult
- Landscaping – free of plastics, sharps & PTE
- Land reclamation – can have low level contamination
- Landfill cover – limited volumes and only fibre

Comparison of manure, digestate, artificials

	FYM	slurry	digested			difference		
			whole	sep.liq	sep.fibre	liq/slurry	wh/slurry	fibre/fym
DM,	30%	8%	4%	1%	30%			
total nitrogen, kg/t	4.5	5.1	5.15	4.49	12.5			
available N, kg/t	1.13	1.53	4.12	4.13	4	2.6	2.59	2.88
Phosphate, kg/t	1.2	1.2	1.16	0.6	6	-0.6	-0.04	4.8
value avail N/t	0.85	1.15	3.11	3.12	3.02	1.96	1.95	2.17
value P/t	1.31	1.31	1.27	0.66	6.57	-0.66	-0.04	5.26
total value €/t	2.40	2.74	4.86	4.19	10.65	1.45	2.12	8.25

Jan '09
prices

1st cut silage	requires	slurry	whole	liquor
N kg/ha		51	120	120
P kg/ha		40	34	17
rate application t/ha		33	29	29
gals/ac	0	3,056	2,670	2,663
Art. Fert top up N kg/ha	120	69	0	0
Art. Fert top up P kg/ha	40	0	6	23
cost €/ha fertiliser	149	58	8	27

What are the risks if no QA?

- One bad story losses market for all
- No distinction between well & poorly operated facilities
- Regulators will dictate limits & applications
- Food assurance schemes might not accept digestate
- If only product standard – very expensive to test enough
- No pressure on waste suppliers to improve quality
- New waste streams becoming available

What is a QA Scheme?

- Sets a standard that digestate products must achieve
- Defines the digestate products
- Maintains quality through monitoring process control
- Ensures QA products meet National Regulations
- Provides central promotion of the value of digestate
- Provides reassurance to farmers & food consumers that digestate products are safe to use as fertilisers

Why not just a product standard

- Test results are only relevant to the sample taken – therefore there must be frequent testing
- In Denmark monitor feedstock only not product – if it is not in the feedstock, cannot be in the product
- AD is a continuous process – if product is contaminated, it is likely the whole digester is contaminated
- If feedstock is clean & AD process is good & correct HRT then product quality should be well maintained

Identify & monitor process critical control points

Types of tests

- Nutrient content, Volatile solids, Dry matter, pH
- Physical contaminants – stones, plastics, sharps
- Seeds and Odour
- Stability
- Particle size for liquids
- Water retention for solids
- Pathogens

If potential to be present

- PTE & Organic compounds content

Potentially Toxic Elements (PTE)

Units mg/kgDM	PAS 110	Biowaste	RAL	Austria A
Cadmium (Cd)	1.5	0.7	1.5	1.0
Chromium (Cr)	100	100	100	70
Lead (Pb)	200	100	150	120
Mercury (Hg)	1.0	0.5	1.0	0.7
Nickel (Ni)	50	50	50	60
Copper (Cu)	200	100	100	150
Zinc (Zn)	400	200	400	500

Due to animal feed additives Cu & Zn could be much higher

Reading results - mg/kg in whole digestate

metals	Hg	Cd	Cr	Cu	Ni	Pb	Zn
Limit	1.0	1.5	100	200	50	200	400
Materials							
Hill Farm	-	<DL	4.7	27.5	4.7	23.4	110.5
Greenfinch	-	<DL	46.2	70.1	11.5	30.7	411.6
Holsworthy	-	<DL	74.2	147.7	4.3	ND	354.4

Therefore PTE limits should be achievable

Managing costs

- QA scheme must be verifiable
- QA scheme must be affordable for all sizes & types of AD
- Cost of QA should be less than benefit
- Feedstock quality control – suppliers cost
- Process control = good operational management
- Product tests related to throughput & level of risk
- Reflect level of market development
- Marketing & publicity costs shared by all

Level of surveillance

- EU standard – doesn't exist
- PAS 110 + quality protocol = guaranteed?
- National Standard & QA
- Industry standard & QA - independently verified
- Industry workshop agreement – self monitored

Points for discussion

- Do we want to develop a QA scheme for digestate
- Should it be for all feedstock, technology & products
- What level of QA
- What would be the benefits to you?
- If there is to be a QA – who should develop it?
- If we are to develop a QA how should we do it?
- What else can be done to promote digestate use?