



Baltic Slurry Acidification Stakeholder Meeting

**Brief overview of other related activities
Wednesday 11.10.2017, Riga, Latvia
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Related activities in Baltic Slurry Acidification

1. Comparative analyses: influence of acidified and non-acidified slurry on types of concrete typically used in BSR countries for slurry storages

- Strength tests
- Analyses of corrosion effects
- SEM-EDS microscopy tests (chemical composition, ettringite is expected to form after at least 1 year of observation of influence of sulphuric ions on concrete)



Related activities in Baltic Slurry Acidification



Concrete samples in the slurry and acidified slurry

Country	Standard	Element	Type of cement, (EN 197-1)?	w/c ratio	Additives (like ashes, silicates)?	Concrete density	Compression strength (cylindrical /cubical), MPa	Exposure class to environment	SO4 penetration, mg/l	Materials for joint/sealing elements?
Estonia	EVS-EN 206:2014	Wall	Portland	min 0.5	Fly ashes	2400 kg/m ³	C30/37	XF1, XC4		Rubber sealant
Estonia	EVS-EN 206:2014	Base	Portland	min 0.5	Fly ashes	2400 kg/m ³	C30/37	XF3, XC4		Rubber sealant
Latvia	LVS EN1992-1-1:2005	Wall and base	CEM II	0.4 - 0.6	Fly ashes	2000...2600	C30/37	XA1	600 - 3000	Bentonite sealant
Poland	PN-EN 206:2014	Wall and base	resistant against SO ₄ , SR / HSR, CEM IIIA and CEM IIIB	0.45	None	2000-2600 kg/m ³	C 25/30	XA3 **	200 (pH >6.5); 600 (pH 6.5-4.5); >600<3000 (pH<4)	Bentonite sealant
Poland		Wall and base					C 30/37			Bentonite sealant
Sweden	SS-EN 206:2013	Storage wall elements	CEM II	0.5	Fly ashes	2400 kg/m ³	C 35/45	XF1, XC4		Expansive concrete
Sweden		Storage base	CEM II	0.6	Fly ashes	2400 kg/m ³	C 25/30	XC2		Expansive concrete

w/c ratio = water:cement

C 25/30= Classes of compression strength (MPa) for normal concrete and heavy concrete.

XA3, Class for exposure to environment in soil and groundwater.

Others? additives like fly ashes, silicatemore?

XF1 Freeze/Thaw attack. Max w/c ratio 0.55, cement content min 300 kg/m³, the filling material must have Freeze/Thaw resistance by standard EN 12620

XF3 Freeze/Thaw attack. Max w/c ratio 0.5, cement content min 320 kg/m³, min air content 4%, the filling material must have Freeze/Thaw resistance by standard EN 12620

XC4 Corrosion induced by carbonation, max w/c ratio 0.5, cement content min 300 kg/m³

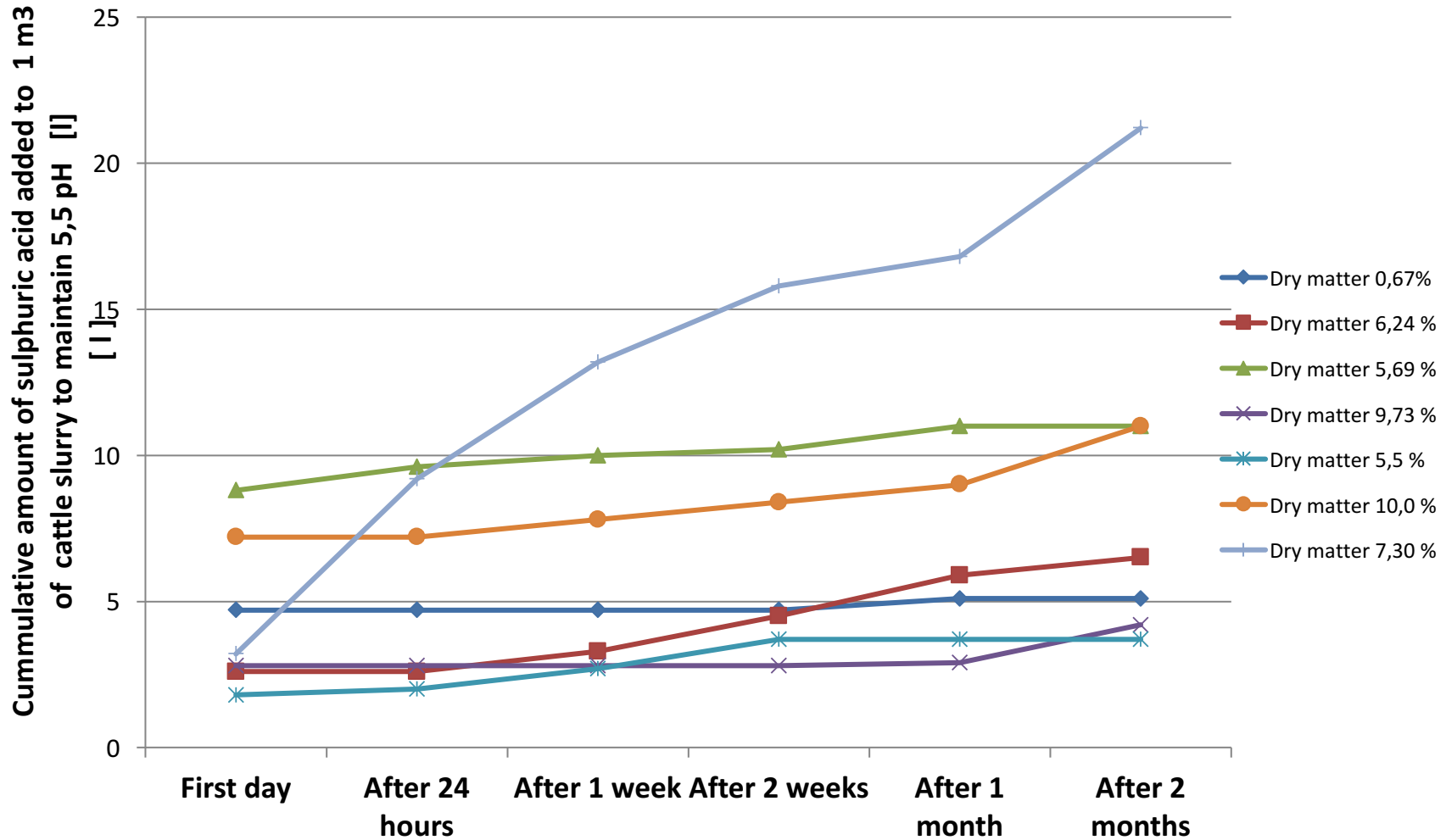
Concrete qualities used in BSA

Blad2

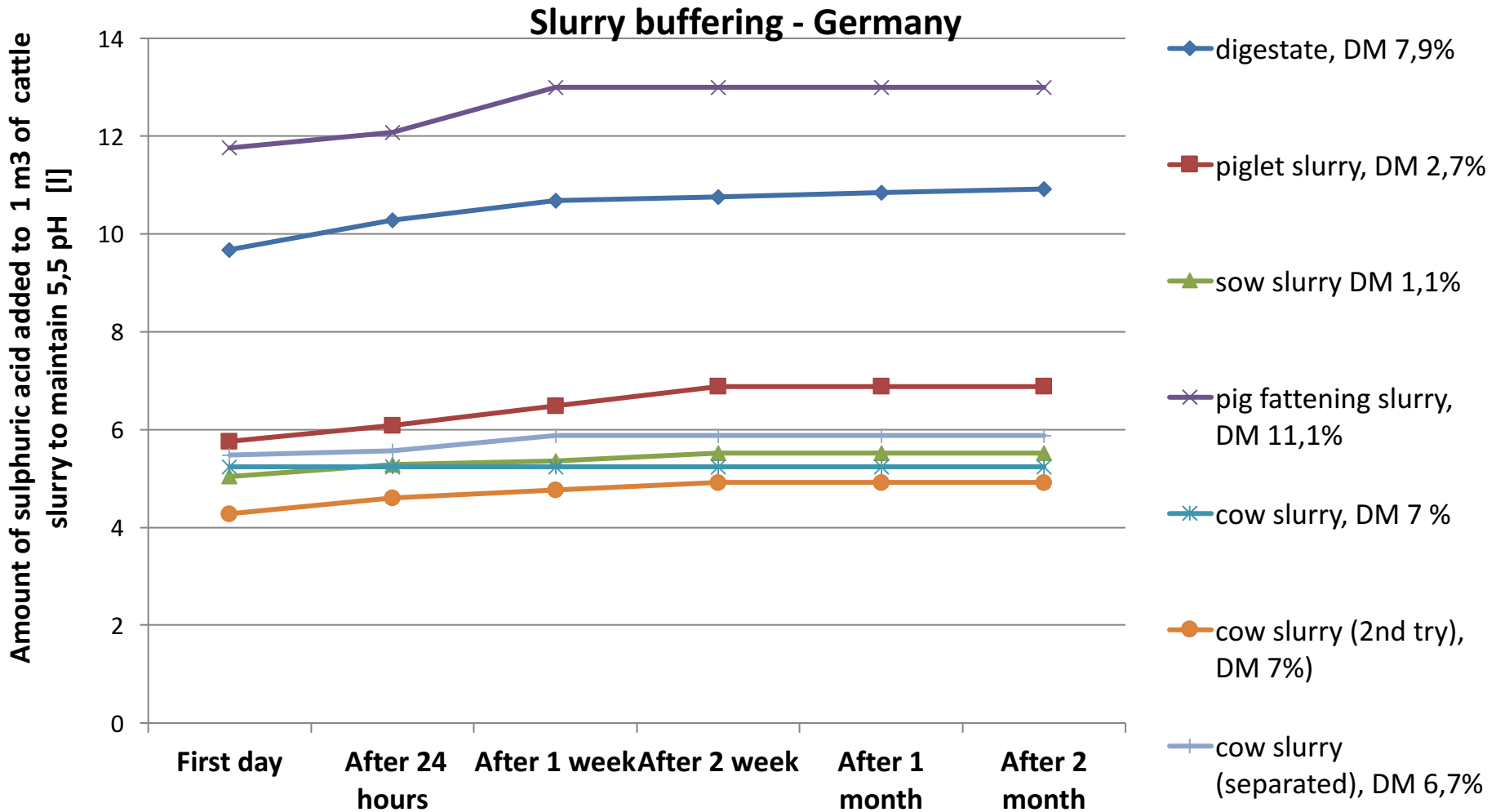
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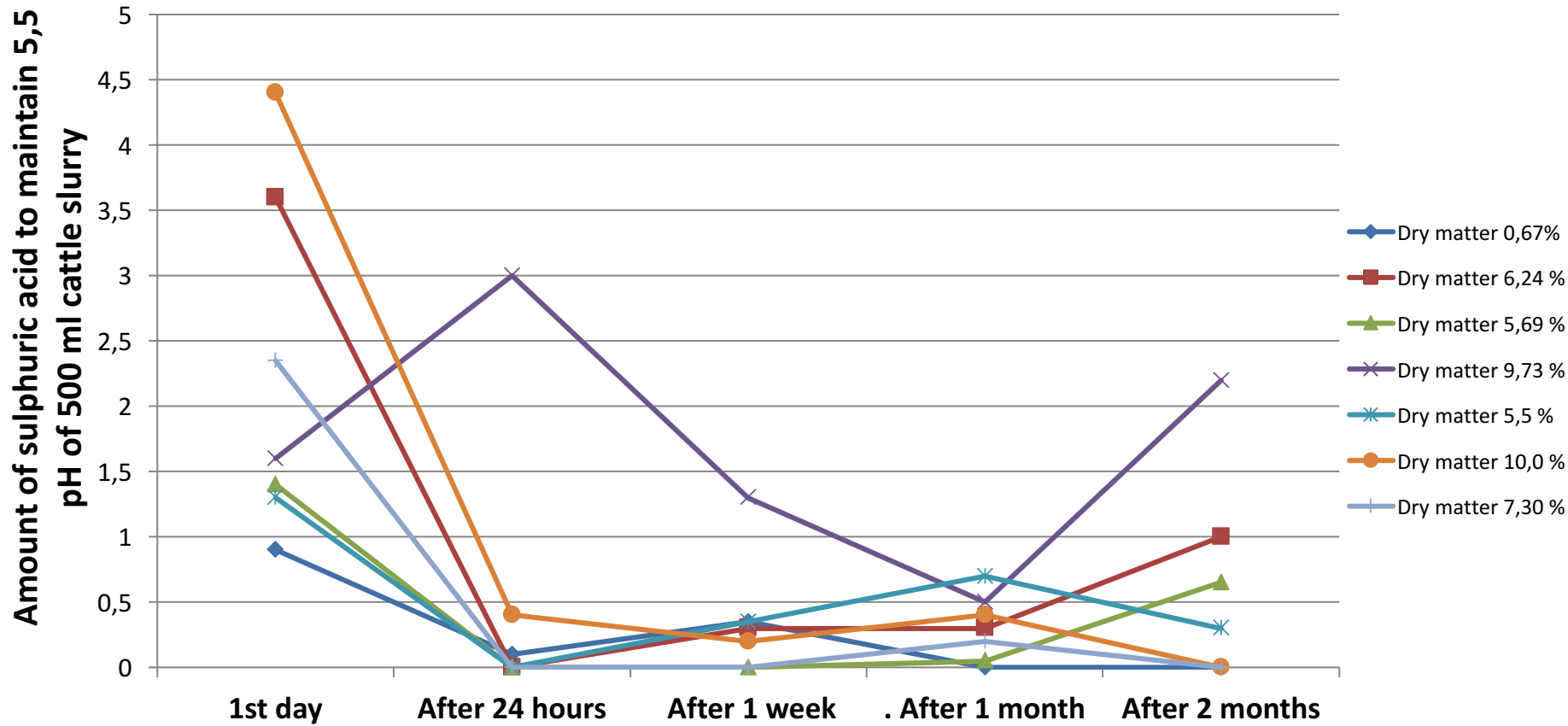
2. Polish experience with cattle slurry acidification and slurry buffering capacity monitoring- 2017



German experience with slurry acidification and slurry buffering capacity monitoring- 2017

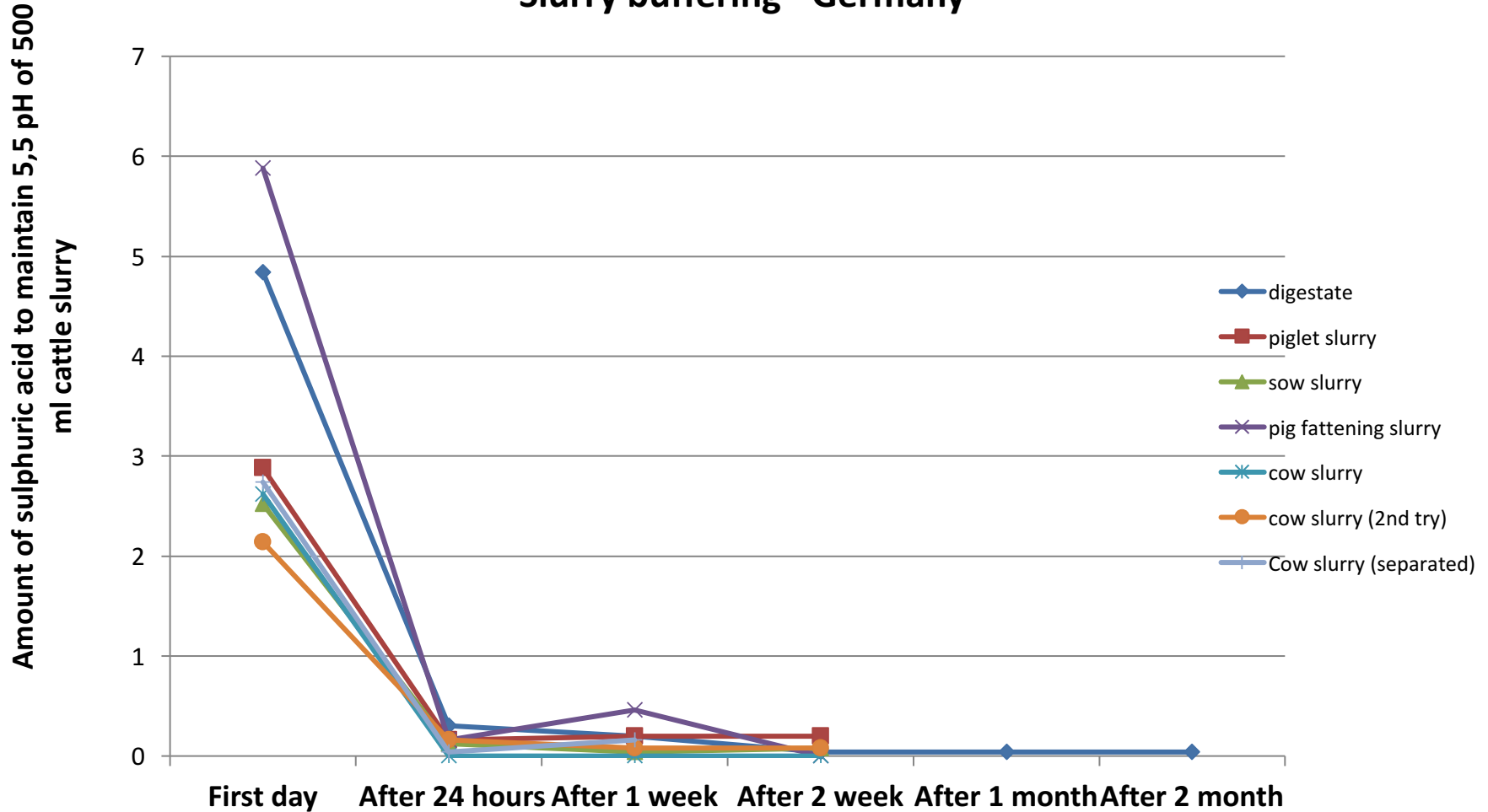


2. Polish experience with slurry acidification and slurry buffering capacity monitoring- 2017



German experience with slurry acidification and slurry buffering capacity monitoring- 2017

Slurry buffering - Germany



3. Slurry acidification effects on soils (A2.4.)

- Soil pH in KCl
- N-NH₄
- N-NO₃
- P-PO₄
- Hh (hydrolitic acidity) (Kappen method)
- Mg
- K
- Ca



Comparison of % ammonia emissions after use of cattle on grassland with and without sulphuric acid 96% and slurry incorporation technic in Poland

Fertiliser dose kg N·ha ⁻¹	Fertilisation technic		
	Without acidification	With acidification	Incorporation to soil without acidification
92	15,23	0,82	1,90
25	13,15	1,20	0,51
60	15,31	2,50	2,50
130	6,10	2,03	2,23
153	7,52	1,34	1,32
160	11,52	1,75	2,13
170	10,45	1,83	1,91

Slurry applications in:

June 2017

July 2017

August 2017