

IMPACT OF EM ON AMMONIA AND GREENHOUSE GAS EMISSIONS FROM ANIMAL MANURE STORES



University of Natural Resources and Applied Life Sciences, Vienna
Department of Sustainable Agricultural Systems

B. Amon, V. Kryvoruchko, T. Amon
Division of Agricultural Engineering

AMMONIA AND GREENHOUSE GAS EMISSIONS:

- Agriculture must reduce NH₃ and GHG emissions under the Gothenburg and under the Kyoto protocol.
- EM influences the microbial environment and stimulates fermentative processes.
- It is anticipated that EM has the potential to reduce NH₃ and GHG emissions from animal manure stores.
- The experiments aimed at investigating the influence of EM on NH₃ and GHG emissions from dairy cattle slurry, pig slurry, and pig farmyard manure.



FIG. 1: BOKU experimental site: Quantification of emissions from pilot scale slurry stores with a large open dynamic chamber

TAB. 1: NH₃ and GHG emissions during storage of cattle and pig slurry with and without EM addition (experiment_1).

treatment	NH ₃ [kg t ⁻¹]	GHG [kg CO ₂ eq. t ⁻¹]
cattle without EM	0.153	37.4
cattle with EM	0.122 ↓	34.6 ↓
pig without EM (low dry matter)	0.338	13.4
pig with EM (low dry matter)	0.354 ↑	15.2 ↑
pig with EM/FKE in the feed	0.267 ↓	12.9 ↓

EXPERIMENT_1:

- Cattle slurry with and without EM
- Pig slurry with and without EM (low dry matter content)
- Slurry from pigs that received EM/FKE with their feed

EXPERIMENT_2:

- Pig slurry with and without EM (normal dry matter content)
- Pig farmyard manure with and without EM

RESULTS:

- EM addition to cattle slurry at the time of storage: reduction of NH₃ and GHG emissions.
- EM addition to pig slurry at the time of storage: impact depends on the slurry dry matter content.
- EM addition to pig farmyard manure at the time of storage: reduction of NH₃ and GHG emissions.
- EM/FKE addition to pig feed: reduction of NH₃ and GHG emissions.

TAB. 2: NH₃ and GHG emissions during storage of pig slurry and pig farmyard manure with and without EM addition (experiment_2).

treatment	NH ₃ [kg t ⁻¹]	GHG [kg CO ₂ eq. t ⁻¹]
pig without EM (normal dry matter)	0.322	144
pig with EM (normal dry matter)	0.286 ↓	179 ↑
pig farmyard manure without EM	3.13	184
pig farmyard manure with EM	1.78 ↓	172 ↓



FIG. 2: EM addition to cattle slurry.

CONCLUSIONS:

EM addition at an early stage of the manure management continuum and on a regular basis helps to optimally evolve positive effects.

Acknowledgements.
The work was funded by
Multikraft Ltd., Austria

