

Collaboration with TFRN Update of the Ammonia Guidance Document

Agriculture and Nature Panel
TFEIP Annual Meeting 2024
Barbara Amon

Continue the collaboration with TFRN



Continue the collaboration with TFRN

- The Task Force on Reactive Nitrogen (TFRN) works under the Working Group on Strategies and Review of the UNECE Convention on Long-range Transboundary Air Pollution
- Several Expert Panels have been set up by the TFRN
 - the Expert Panel on Mitigation of Agricultural Nitrogen (EPMAN)
 - the Expert Panel on Nitrogen Budgets (EPNB)
 - the Expert Panel on Nitrogen and Food (EPNF)
 - the Expert Panel on Nitrogen in countries of Eastern Europe Central Caucasus and Asia (EPN-EECCA)

Continue the collaboration with TFRN

- The Expert Panel on Nitrogen and Food (EPNF) has recently published the report "Appetite for Change: Food system options for nitrogen, environment & health."
- Under the UNECE Convention on Long-Range Transboundary Air Pollution (Geneva Air Convention), the Task Force on Reactive Nitrogen (TFRN) has developed the "Guidance Document on Integrated Sustainable Nitrogen Management."

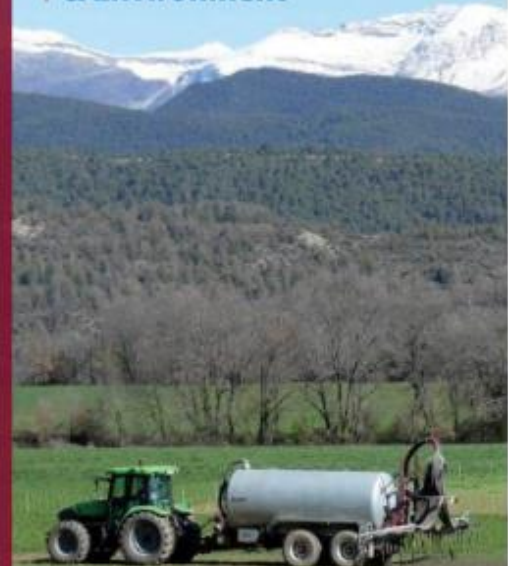
Appetite for Change

Food system options for
nitrogen, environment & health



2nd European Nitrogen Assessment
Special Report on Nitrogen & Food

Nitrogen Opportunities for Agriculture, Food & Environment



UNECE Guidance Document on Integrated
Sustainable Nitrogen Management

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Appetite for Change

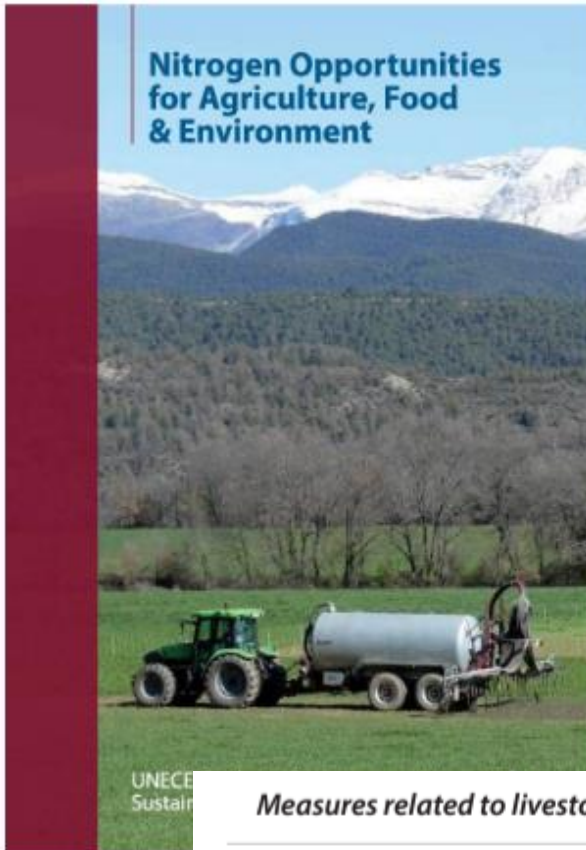
Food system options for nitrogen, environment & health



2nd European Nitrogen Assessment
Special Report on Nitrogen & Food

- Chapter 1. Nitrogen and food systems
- Chapter 2. Nitrogen in the food system: health and environment implications
- Chapter 3. Food system archetypes
- Chapter 4. The scope to improve nitrogen use efficiency of European food systems
- Chapter 5. Future foods as alternatives to conventional animal-based foods
- Chapter 6. Sustainability-minded food-based dietary guidelines as a tool to promote human and planetary health
- Chapter 7. Consumer-oriented food policies for healthy and environmentally sustainable diets
- Chapter 8. Governing a transition towards a sustainable food system
- Chapter 9. Navigating towards future food systems with a Sustainability Compass
- Chapter 10. Reaching nitrogen reduction emissions targets in the European Union

Continue the collaboration with TFRN

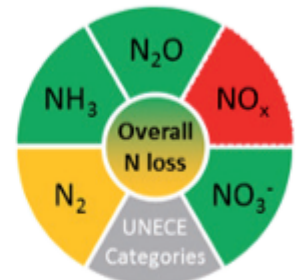


- Overview for policymakers Nitrogen opportunities for agriculture, food and environment
- Technical overview Integrating principles and measures for sustainable nitrogen management in the agrifood system
- Principles of integrated sustainable nitrogen management
- Housed livestock, manure storage and manure processing
- Field application of organic and inorganic fertilizers
- Land-use and landscape management
- Development of packages of measures for integrated sustainable nitrogen management

Measures related to livestock diets

Dietary Measure 1: Adapt protein intake in diet (dairy and beef cattle)

Adaptation of crude protein in the diet to match the needs of animals is the first and most efficient measure to mitigate N emissions. This measure decreases the excretion of excess N and thus reduces emissions along the whole manure management chain. Increasing the energy/protein ratio in the diet is a well-proven strategy to reduce levels of crude protein. For grassland-based ruminant production systems, the feasibility of this strategy may be limited, as older grass may reduce feeding quality.



Update of the Ammonia Guidance Document

- The Expert Panel on Mitigation of Agricultural Nitrogen (EPMAN)
 - Contributes to updates of the code of good practice for reducing ammonia emissions
 - Contributes to the review of the Gothenburg Protocol
 - Review was finished and may likely result in Protocol revision
 - Annex IX of the Gothenburg Protocol (mitigation measures) stayed unchanged in 2012 => status of mid-1990s!
 - Art. 10(4) explicitly specifies the need to “evaluate ammonia control measures and consider the need to revise Annex IX”

Options for Ammonia Mitigation

Guidance from the UNECE Task Force on Reactive Nitrogen



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Options for Ammonia Mitigation

Guidance from the UNECE Task Force on Reactive Nitrogen



Update of the Ammonia Guidance Document

- The Ammonia Guidance Document is meant as a state-of-the-art reference document for preventing and abating ammonia emissions from agricultural sources. It shows the various possible measures in the whole 'animal feeding – animal housing – manure Management chain'. It discusses the effectiveness of the measures as well as the economic cost of the measures.
- This second revised Ammonia Guidance Document has been adopted by the Executive Body (decision 2012/11), being released as document ECE/EB.AIR/120.
- services in refining and publishing their own national ammonia codes, to be used by extension services and farmers.

Options for Ammonia Mitigation

Guidance from the UNECE Task Force on Reactive Nitrogen



Update of the Ammonia Guidance Document

- Category 1 techniques and strategies: These are well researched, considered to be practical or potentially practical, and there are quantitative data on their abatement efficiency, at least on the experimental scale;
- Category 2 techniques and strategies: These are promising, but research on them is at present inadequate, or it will always be difficult to generally quantify their abatement efficiency. This does not mean that they cannot be used as part of an NH₃ abatement strategy, depending on local circumstances;
- Category 3 techniques and strategies: These have not yet been shown to be effective or are likely to be excluded on practical grounds.

Table 12
Ammonia emission abatement measures for cattle and pig slurry storage

Abatement measure	NH ₃ emission reduction (%)	Applicability	Costs (OPEX) (€ per m ³ /yr) ^a	Extra costs (€ kg NH ₃ -N reduced) ^b
Store with no cover or crust (<i>reference technique</i>)	0		—	—
"Tight" lid, roof or tent structure (cat. 1)	80	Concrete or steel tanks and silos. May not be suitable for existing stores.	2-4	1.0-2.5
Plastic sheeting ^c (floating cover) (cat. 1)	60	Small earth-banked lagoons.	1.5-3	0.6-1.3
Allowing formation of natural crust by reducing mixing and manure input below the surface (floating cover) (cat. 1)	40	Only for slurries with higher content of fibrous material. Not suitable on farms where it is necessary to mix and disturb the crust in order to spread slurry frequently. Crust may not form on pig manure in cool climates.	0	0
Replacement of lagoon, etc., with covered tank or tall open tanks (depth > 3 m) (cat. 1)	30-60	Only new build, and subject to any planning restrictions concerning taller structures.	15 (about 50% cost of tank)	—
Storage bag (cat. 1)	100	Available bag sizes may limit use on larger livestock farms.	2.50 (includes cost of storage)	—
Floating LECA balls, Hexa-Covers (cat. 1)	60	Not suitable for crusting manures	1-4	1-5
Plastic sheeting ^c (floating cover) (cat. 2)	60	Large earth-banked lagoons and concrete or steel tanks. Management and other factors may limit use of this technique.	1.50-3	0.5-1.3
"Low technology" floating covers (e.g., chopped straw, peat, bark, etc.) (cat. 2)	40	Concrete or steel tanks and silos. Probably not practicable on large earth-banked lagoons. Not suitable if materials likely to cause slurry management problems.	1.50-2.50	0.3-0.9

^a Now: For economic cost of the abatement techniques, see Rais (forthcoming).
^b Calculated for storage of pig slurry in stores ranging from 500 to 5,000 m³ capacity for temperate regions of Central Europe. The reference is slurry with no crust.
^c Sheetting may be a type of plastic, canvas or other suitable material.

Update of the Ammonia Guidance Document

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Update of the Ammonia Guidance Document

- Work started 1.5 years ago with creation of the core group of researchers and other actors potentially interested and finally involved in the revision process. Several on-line meetings taking place with a hybrid one in November at Aarhus University.
- There is a group of c. 30 people from more than 12 countries coordinating the revision of each chapter. Revision coordinated by Alberto Sanz-Cobeña (UPM, Spain), Rasmus Einarsson (SLU, Sweden) and being done through EPMAN (Shabtai and Barbara as co-chairs and co-coordinate the revision too).
- Expected timeline:
 - Progress to be discussed in June in Aarhus TFRN meeting (19th June 2024).
 - Main revision by this autumn and over winter 2024.
 - possible workshop with stakeholders early 2025 in Brussels (not yet confirmed).
 - Most likely expect adoption therefore EB Dec 2026 rather than 2025, unless there is a second WGSR during 2025.

Update of the Ammonia Guidance Document

- Chapter 1. Ammonia abatement through a systems approach
- Chapter 2: Livestock feeding strategies
- Chapter 3. Livestock housing
- Chapter 4. Manure treatment (inc. acidification, additives, separation, AD, composting)
 - **NEW CHAPTER**
- Chapter 5. Manure storage
- Chapter 6. Manure application
- Chapter 7. Synthetic fertilizer application
- Chapter 8. Non-agricultural ammonia emissions
- Annex A. Methods for measurements & Quality criteria of publications
 - **NEW CHAPTER**
- Annex B. Ammonia and interactions with (all) GHG (focusing on methane)
 - **NEW CHAPTER**