

# Large scale application of mineral concentrates in The Netherlands



INTERREG IVB

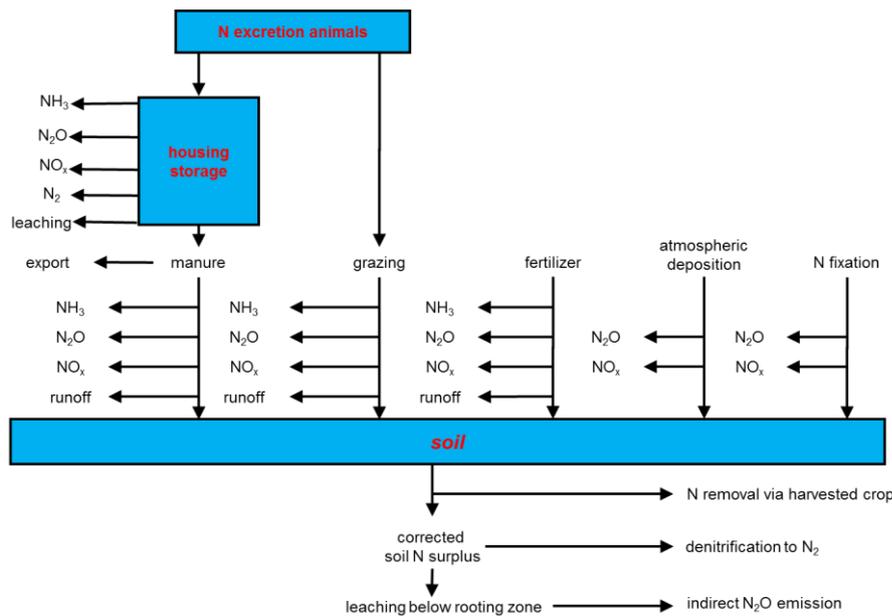


## Effects on nutrient flows and emissions

The Biorefine project aims to provide innovative strategies for recycling of inorganic chemicals from agro- and bio-industry waste streams. The project is financed via Interreg IVB. <http://www.biorefine.eu/>

**Introduction** A local manure surplus can be handled by manure processing, e.g. by separating it into a liquid and a solid fraction. Limits set to the amount of nitrogen and phosphorus from animal manure that may be used on agricultural land, also reduce the possibility to apply these fractions directly. Reverse osmosis applied on the liquid fraction produces an end-product called mineral concentrate. It is close to liquid N-fertilizers, and has a high N and K content and low P content. If this is recognized by EC as a mineral N-source, more manure products could be applied within the application standards. A desk study was carried out on the consequences of large scale application of mineral concentrates for  $\text{NO}_3$ ,  $\text{NH}_3$ ,  $\text{CH}_4$  and  $\text{N}_2\text{O}$  emission, and for the manure surplus in The Netherlands.

**Methods** The model MITERRA-NL was used to calculate surpluses of N and P, N-leaching to ground water and surface water, and emissions of  $\text{NH}_3$ ,  $\text{CH}_4$  and  $\text{N}_2\text{O}$ . Scenarios were calculated on 1) the portion of total pig or cattle manure that is converted into mineral concentrate; 2) lowering N and P excretion; 3) varying manure N application standard; and 4) export of solid fraction of manure. It was assumed in the scenarios that concentrates can be applied as if they are mineral fertiliser.



*Scheme showing which nitrogen flows are calculated by the model MITERRA-NL for an agricultural system with grazing or housed animals.*

*More info about the model: Velthof et al. (2009)*

**Results** Scenario calculations showed that large-scale application of mineral concentrate in the Netherlands would lead to more opportunities to use nutrients of (processed) manure. Less export of manure is needed, by which the need for mineral N and P fertilizers decreases. The effects on emission of  $\text{NH}_3$  and  $\text{N}_2\text{O}$  are limited. Lowering N and P excretion with 10% or 20%, resp., would make it possible to apply all manure produced within The Netherlands. Combining lower excretion and use of concentrates would make it possible to increase the number of animals.

**Further reading** J.P. Lesschen et al. (2011) Alterra Report 2247. [\[link\]](#); G.L. Velthof (2011) Alterra Report 2224. [\[link\]](#); G.J. Velthof et al. (2009) J. Environ. Qual. 38:402-417.



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