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Nitrogen and the environment

HEALTH · NUTRITION · MATERIALS

Nitrogen is a major pollutant

Emission of Greenhouse Gases:
- CO_2 - from fertilizer production from use of energy
- N_2O - from application of N-fertilizers and manure
- CH_4 - from ruminants, from paddies

Agriculture is responsible for 60% of global N_2O emissions and 50% of global methane emissions

Global warming

Emission of nitrate: NO_3^-:
- from use of fertilizers
- from manure

Agriculture is main source of nitrate pollution
Nitrate pollution of ground water is also a health issue

Nutrient enrichment

Algal blooms oxygen depletion

Emission of ammonia: NH_3^+:
- from use of fertilizers
- from manure

In W Europe 92% of ammonia emissions are agricultural
Ammonia is also an animal health issue

Acidification

Acid rain

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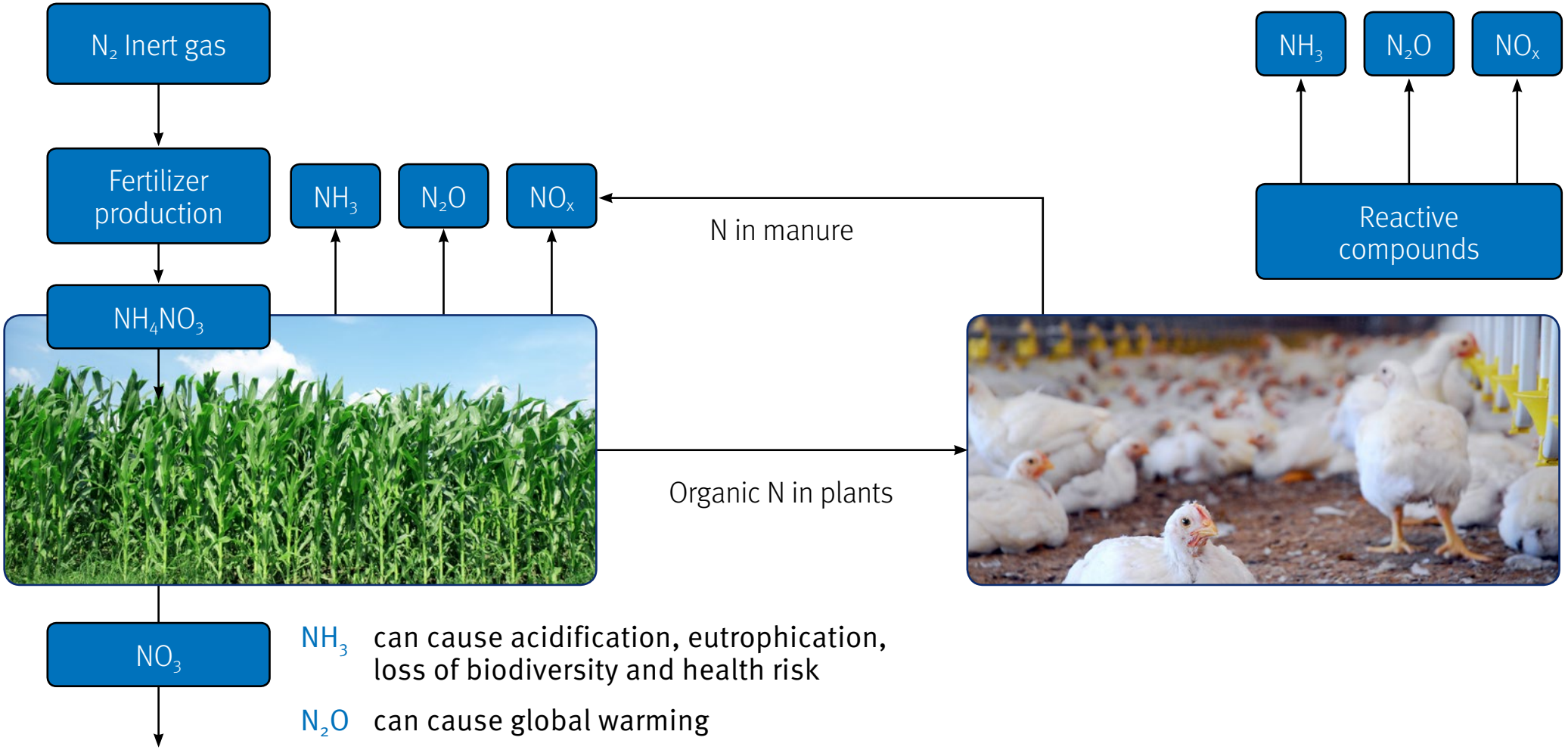
Agriculture converts inert nitrogen into a range of reactive compounds damaging to the environment



NH_3 can cause acidification, eutrophication, loss of biodiversity and health risk

N_2O can cause global warming

NO_x can cause smog formation

NO_3 can cause nutrient enrichment and loss of biodiversity

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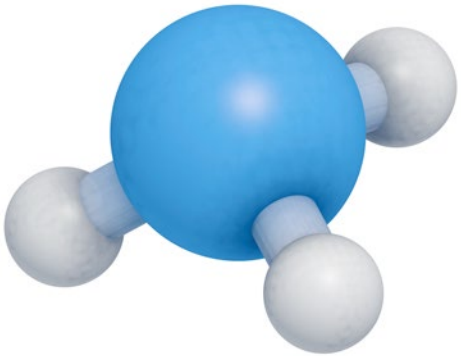
Ammonia (NH_3) pollution and broiler production - some basic facts

- NH_3 is released from litter in the poultry house and when spread on fields
- Proteins which are not absorbed and amino acids which are in excess are catabolised and lead to an increase in nitrogen excretion and NH_3 production
- Lowering dietary crude protein is an effective way to reduce nitrogen levels in the manure and NH_3 production



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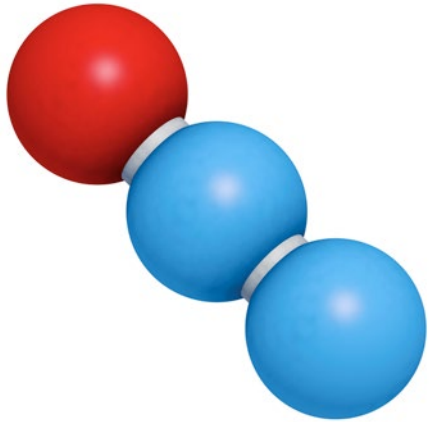
Nitrous oxide (N_2o) pollution and broiler production - some basic facts

- Nitrous oxide (N2O) is generated from oxidation/reduction of nitrogen compounds in poultry litter during drying, storage and composting
- The greenhouse effect of N2O is approx. 300 x that of CO2 and has the largest impact on total global warming after CO2 and methane
- N2O emissions are proportional to the amount of nitrogen excreted in animal waste
- Low protein diets can contribute to the prevention of global warming by reducing the amount of nitrogen contained in litter



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