Sources of nitrous oxide in organically managed grass-clover pastures
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Background
Organic farming practices, and in particular dairy production systems based on grass-clover pastures are becoming increasingly abundant within Danish agriculture. Grass-clover pastures may provide a mitigation option to reduce grassland nitrous oxide (N₂O) emissions (Velthof et al. 1998). The objectives of this work was to examine the relationship between N₂O emissions and transformations of inorganic N in organically managed grass-clover pastures of different ages. Results from the project will be used for calibration of the FASSET whole-farm nitrogen transformation model.

Injection of 15N-labelled NH₄ and NO₃ (10 APE) in 30 cm diam. × 25 cm high monoliths of the grass-clover pastures.

Conclusions
- Nitrous oxide emissions losses from organically managed grass-clover pastures were relatively small amounting to 0.8 to 0.14 mg N m⁻² d⁻¹.
- The N₂O emission was less than 0.2% of the N-fixation.
- The N₂O emission decreased with increasing pasture age, independent of soil N availability.
- Nitrification and denitrification both contributed significantly to the N₂O emissions.
- The proportion of denitrification vs. nitrification appeared to increase with increasing pasture age.

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References

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