



## Agriculture and climate

Agriculture emits considerable amounts of the greenhouse gases methane and laughing gas. In addition, changes in the soil's carbon storage in connection with cultivating the soil can contribute to either emissions or storage of CO<sub>2</sub>.

In Denmark, agriculture contributes 14-16% of the total emissions of greenhouse gases. Emissions of methane and laughing gas from Danish agriculture fell by 24% between 1990 and 2006, mainly because of fewer heads of cattle and a considerable increase in agriculture's carbon efficiency as plans to protect the aquatic environment were implemented.

According to OECD figures covering the years 1990-2002, Denmark is one of the few OECD member states that have managed to combine growth in agricultural production with reductions in greenhouse gas emissions.

For the world as a whole, total emissions from agriculture are estimated at 17-32% of all emissions, and a large part of these emissions are related to livestock production. The large imprecision in the figures is due to uncertainties about emissions from tree-felling and soil cultivation in developing countries in particular.

### Laughing gas and methane

Methane (CH<sub>4</sub>) and laughing gas (N<sub>2</sub>O) are the greatest contributors to agriculture's greenhouse gas emissions. The greenhouse effects of methane and laughing gas are 23 and 296 times as powerful respectively as the greenhouse effect of carbon dioxide (CO<sub>2</sub>). Emissions of even relatively small quantities of laughing gas therefore have a large impact on the climate.

### Cows' digestion

Most methane emissions from agriculture derive from the digestive system of ruminants, and in Denmark this is primarily cows. This is why beef is one of the foods classified as least climate friendly. It is possible to reduce the emissions of methane by changing the cows' feed so it contains more fat, which however also would increase the fat content of the milk.

## Liquid manure

Liquid manure tanks emit methane, so treating liquid manure in biogas plants would reduce emissions of this greenhouse gas considerably. There are also other possibilities for reducing these emissions, such as a permanent cover over the liquid manure tank, acidification of the liquid manure, and adding substances that impede the development of methane.

## Animal manure

Emissions of laughing gas derive in particular from animal manure in manure stores or after the manure has been spread on the soil.

The loss of nitrogen through ammonia evaporation and nitrate leaching also leads to emissions of laughing gas.

Laughing gas emissions can be reduced by restricting the use of nitrogenous fertilisers, by better utilisation of nitrogen e.g. while manure settles in storage tanks, or by using nitrification inhibitors. In addition, emissions can be reduced by carefully planning fertilisation, for example so the fertiliser is dispersed at a time when the plants actually need it.



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