

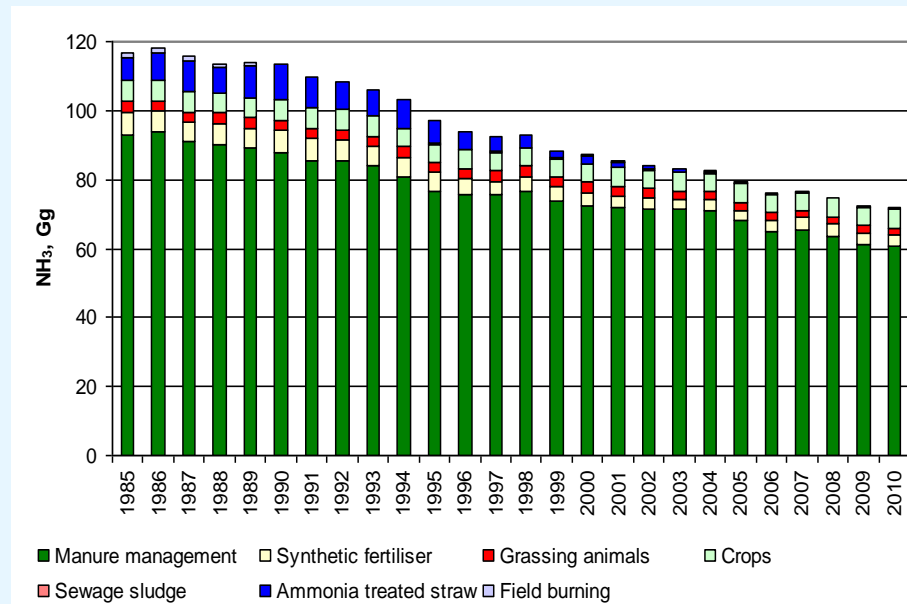


Ammonia emission in Denmark

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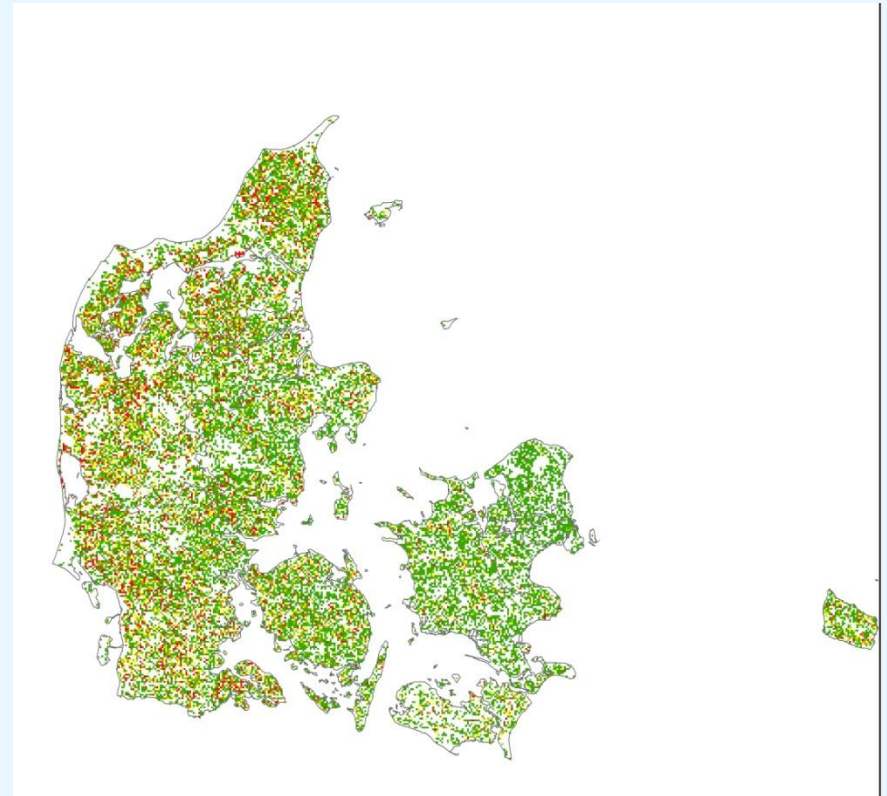
Ammonia emission 1985-2010

- › **Emission decreased 39%**
 - › improved feed efficiency
 - › higher utilisation of N from manure
 - › lower use of synthetic fertiliser
 - › use of NH_3 -reducing techniques



Ammonia emission in Denmark, 2010

- › **Highest NH_3 emission in southern and northern Jutland**
 - › **intensive animal production**



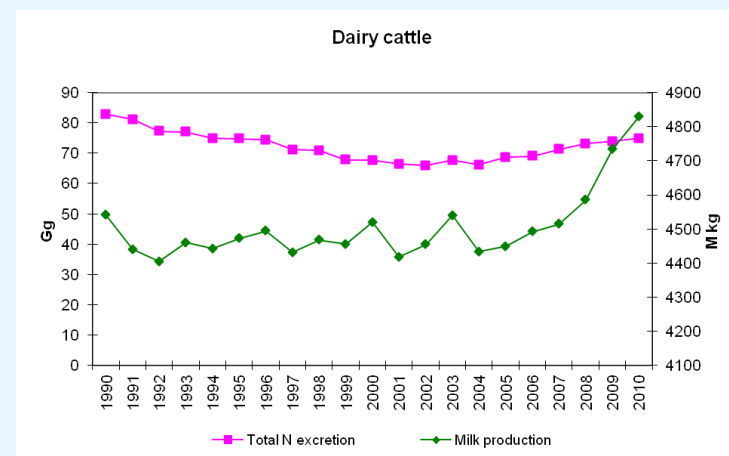
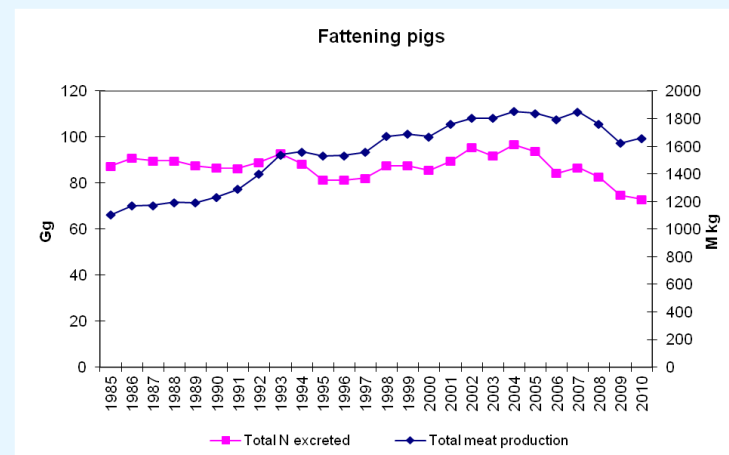
N-excretion

› Pigs

- › genetic improvements
- › feeding strategies
- › use of synthetic amino acid

› Dairy cattle

- › almost unaltered nitrogen excretion
- › higher milk production



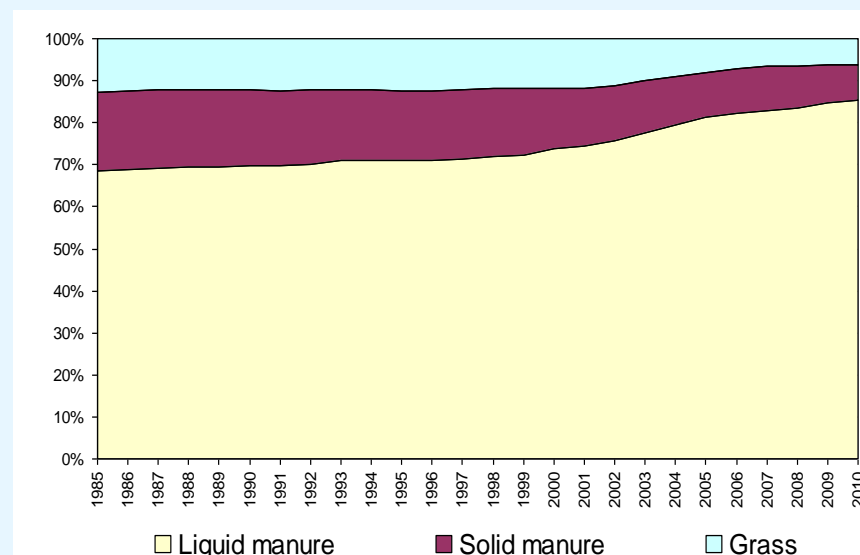
Housings

- › **Distribution of housings for dairy cattle and fattening pigs**
 - › **Similar trends for other groups of cattle and pigs**

		1985	1990	1995	2000	2005	2010
Dairy Cattle	Tied-up housings	85	79	73	46	20	12
	Loose-holdings with beds	14	18	21	43	70	82
	Deep litter	1	3	6	11	10	6
Fattening pigs	Full slatted floor	29	51	60	58	53	54
	Partly slatted floor	30	23	24	31	38	42
	Solid floor	40	22	11	5	3	2
	Deep litter	1	4	5	6	6	3

Manure

- › **Change in housings increase the share of liquid manure to 85 % in 2010**
- › **Dairy cattle in loose-holdings have less grazing time compared with dairy cattle in tied-up housings**



Manure application

- › **Tightened regulations for manure application have forced farmers to change manure application techniques**
 - › autumn application is not allowed
 - › broad spread of liquid manure is banned
 - › solid manure on black soil shall be incorporated within 4 hours
 - › liquid manure on black soil and close to natural habitats shall be injected

Manure application

- › **Main part of cattle manure is in 2010 injected**
 - › Crop rotation with grass and fodder crops which give more black soil than pig farmers
 - › Rules for injection of manure on black soil forces farmers to inject a big part of the manure
- › **Main part of pig manure is in 2010 applied with trailing hose**
 - › More cereals in the crop rotation
 - › Demands for having green crops during winter to reduce leaching of nitrogen

Farm size

- › **Number of farms in Denmark has decreased with more than 50 % from 1985 to 2010**
- › **Size of the farms has increased from a average size of 29 ha from 1985 to 61 ha in 2010**
- › **The share of cattle farms with more than 100 dairy cattle have increased from 1 % from 1985 to 59 % in 2010**
- › **For pig farms have the share of farms with 1000-5000 pigs increased from 3 % from 1985 to 49 % in 2010**

Current ammonia regulations

- › **If a farmer want to enlarge or change his animal production, he has to go through an approval**
 - › He will be met by a demand of 30 % less NH_3 emission than from a average productivity, given in the Danish normative nitrogen system and Best Available Housing Technology (BAT)
 - › To meet the target the farmer can include feeding technique and/or implement NH_3 reducing technologies in the housings to lower the NH_3 emission
- › **Based on this it is expected that the Danish NH_3 emission can in 2020 be reduced with 15-25 % without any further regulations**
 - › The turn-rate for livestock buildings in Denmark is around 10 years for pigs and 20 years for dairy cattle



Thank you for your attention