Economic aspects of manure management – the case of the Danish pigmeat sector

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Agenda

• Short introduction to the Danish pigmeat sector

• The Danish pigmeat sector in an environmental legislative context – EU requirements and national implementation hereof/additional requirements

• Various aspects, including the economic aspect, of the handling of manure

• Results, perspectives and conclusions
Introduction to the Danish pigmeat sector
Structure development

Suppliers
• 1990: 33,000 suppliers (approx)
• 2010: 4,500 suppliers (approx)

Production mil. pigs
• 1990: 16,3
• 2010: 28,6
Introduction continued…

Pig Producers 4,500

28.6 m Pigs
2.1 m tonnes of pigmeat

Live export: 7.5 m piglets
Live export: 1.0 m sl.pigs/sows

Private sl.houses: 2.0 m.
Cooperative Slaughterhouses: 18.1 m pigs

Markets
Export  90%
Domestic 10%

Value: 31 DKK bill.

Export 28.1 DKK bill.
Domestic market: 3 DKK bill.
Export destinations

- Germany
- Russia
- Eastern Europe
- Japan
- UK
-日本
- AUS
- USA (ribs)
- Italy
- Sweden
- UK
- France
- Germany
- China
- China
- China
- China
The Danish pigmeat sector in an environmental legislative framework
The situation of Denmark

- 5,5 mio people
- Produce 28.5 mio pigs
- Surrounded by costal zones
- No cleaning of drinking water
- Classified as sensitive area
- Outdoor pig production not possible
Environmental legislative framework

• Various EU directives (Habitat, Nitrate, IPPC/IED)

• National implementation of EU requirements and additional national requirements.

• Best Available Techniques (BAT) – In depth implementation of this concept in Denmark, e.g. regarding:
  – Slurry/manure
  – Noise and odour
• Various aspects of the handling of manure
Different aspects of handling the manure/slurry

1. Efficient use of feed
2. Handling of manure in staples
3. Storage of slurry
4. Spreading slurry on the fields
Efficient use of feed

- Low feed conversion ratio
- Exploit the minerals in the feed by fx adding phytase
- Reduce the amount of nutrients in slurry
- Genetics
PROGRESS – FEED CONVERSION RATIO

Kg feed per kg gain

Handling of slurry/manure in staples

- Cooling of slurry
- Floor design (partly or fully slotted floor, reducing manure channels)
- Air cleaning mechanisms (acidifications)
Storage of slurry

• Requirement for 9 month storage capacity since 1986

• Covered slurry tanks to reduce ammonia emission, greenhouse gas emission (CO$_2$, CH$_4$, N$_2$O) and odour

• Covered slurry tanks can reduce ammonia emission from 9 percent to 1 percent
Handling of slurry

- Compulsory yearly manure accounts

- Hamony - Balance between land and animal units or written contracts

- Requirements for utilization of nitrogen in slurry equal to 75 percent

- Allocation of slurry: 10 pct. Below economic optimum

- Maximum application of 140 kg nitrogen per hectare

- No broad spreading of slurry allowed

- Requirements for catch crops during winter

- Spreading of slurry only allowed from February to harvest

- More strict requirements for vulnerable areas
The economic aspect of manure management

- Significant investment - 3 mio US $ spend each year on applied research and development by the pig industry

- BAT (1- 1,5 EUR pr. produced slaughterpig).

- Outcome of the EU BAT-negotiations in Sevilla?

- Biogas, political priorities and prices.

- The costs have to recouperated.
Results, perspectives and conclusions
ENVIRONMENTAL IMPROVEMENTS

• “Today we can produce two pigs with same environmental impact as just one pig in 1985”
Environmental improvements

- Nitrate 1985-2010: 47%
- Phosphorous 1985-2010: 51%
- NH3 loss 1990-2007: 61%
- Use of artificial fertiliser: 50%

NH3 loss 1990-2007
Phosphorous 1985-2010
Nitrate 1985-2010
Use of artificial fertiliser
Future development

Commercial farming with a minimal environmental impact
Future development
CO$_2$ neutral farms with high level of animal welfare