Greenhouse gas emissions from the Irish sheep sector

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Irish sheep sector

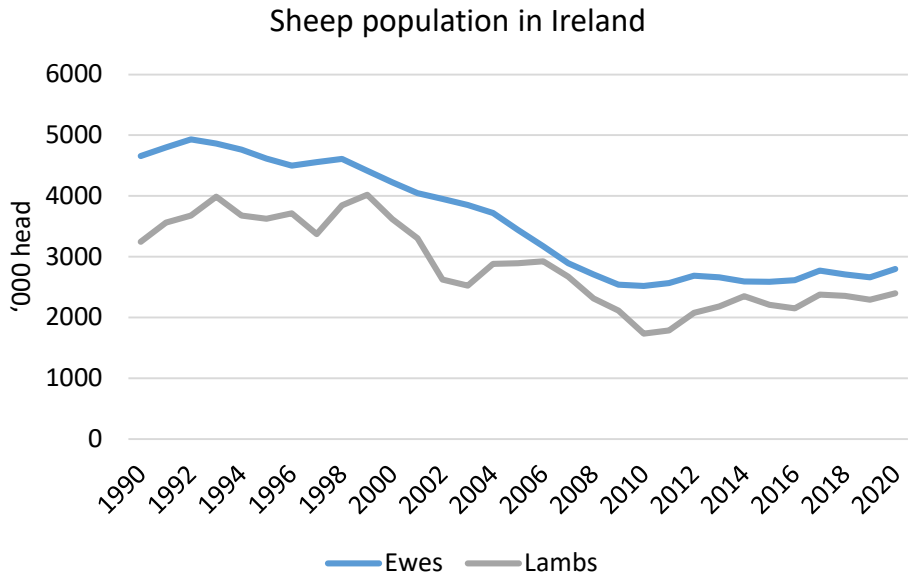
- The Irish sheep sector is largely focused on spring lamb production

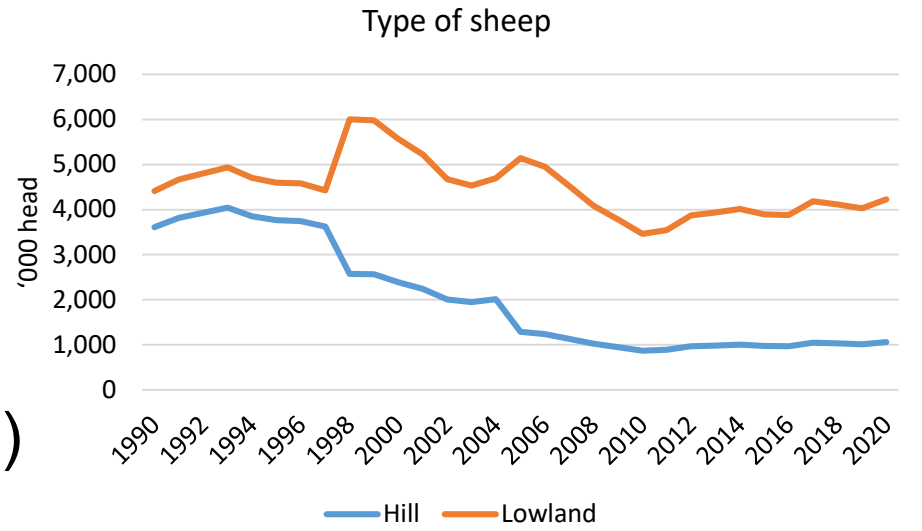
- In 2020 there were 2.7 million breeding ewes
  - 80% lowland
  - 20% hill

- 35,505 farms with sheep enterprise (CSO,2022)
  - Average farm size – 83 ewes
  - 17,435 specialist sheep farms

- 335% self-sufficient in sheep meat

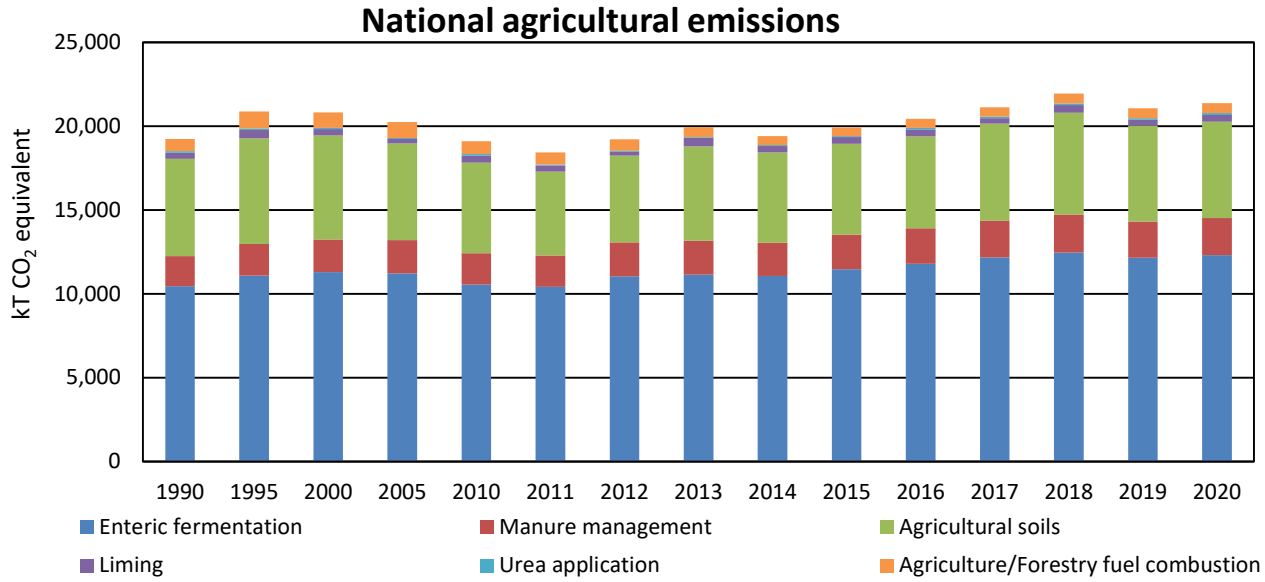
- Irish sheep meat exports- €420 million (Bord Bia, 2022)
  - +12% vs. 2020
  - France largest market (30.5%)

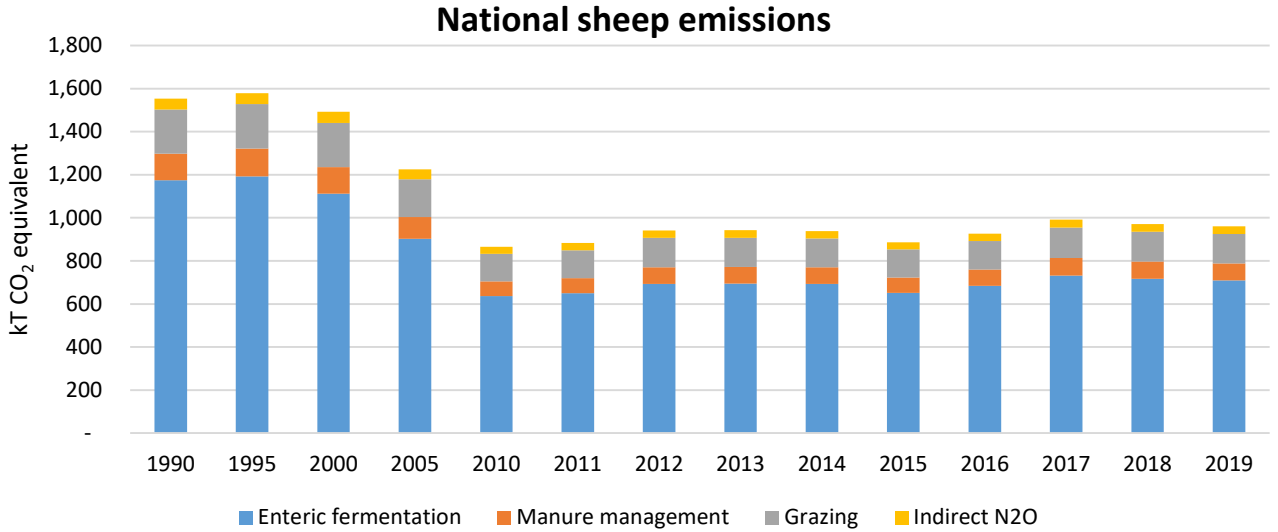




National GHG emissions - Sheep

- Livestock have been identified as a notable source of GHG emissions
- Agriculture is responsible for 37% of national GHG emissions
- Agricultural sector dominant by cattle related emissions
- Sheep emissions peaked in 1990s.
- Slow increase in sheep related emissions since 2010
- Need to contribute to the mitigation of GHG emissions





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Life cycle assessment (LCA)

Includes:

- Emissions released by on-farm processes
- Emissions released during the production of farm inputs

System boundary

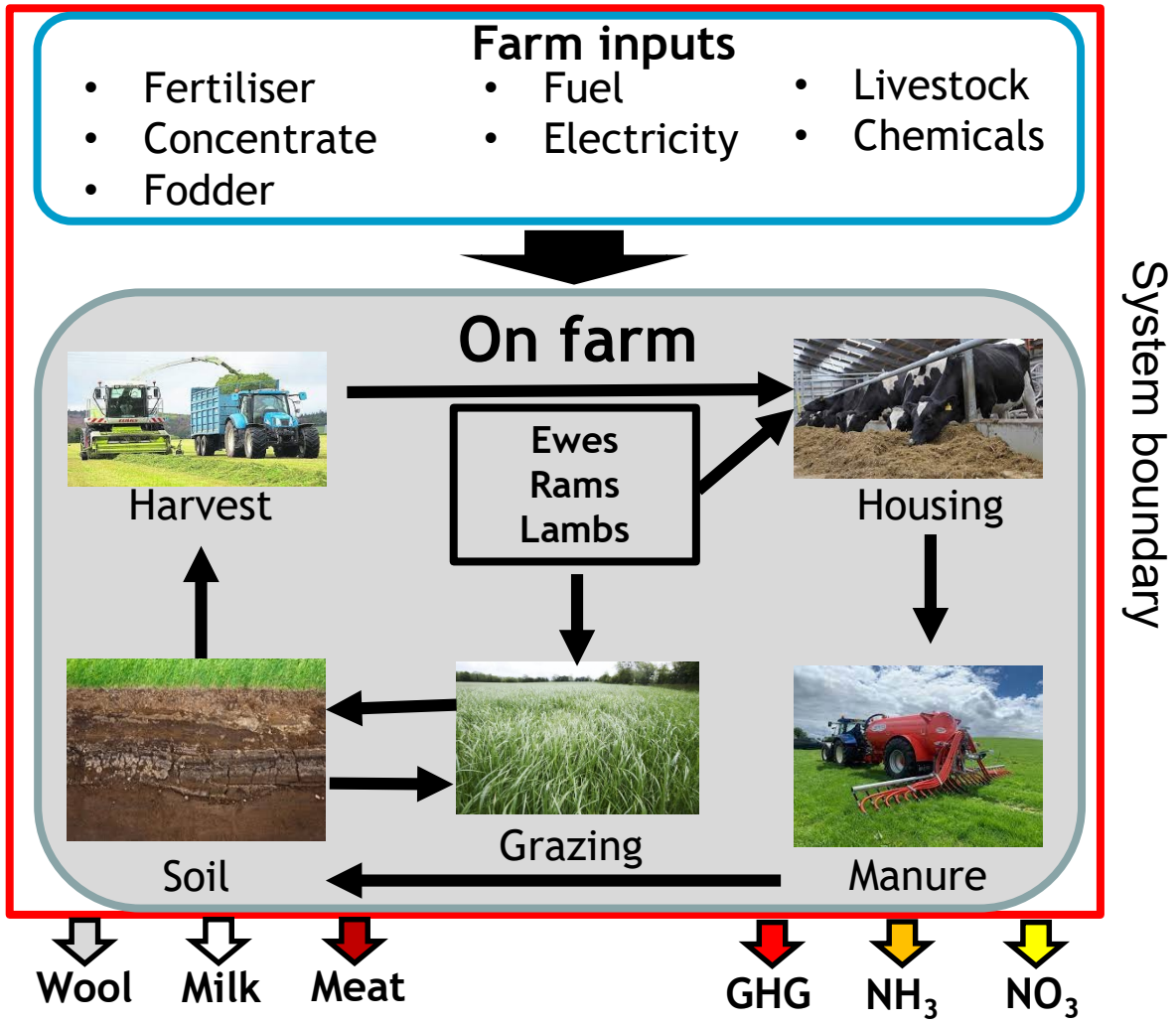
- Cradle-to-farm gate
  - Emissions generated up to the sale of animals.

Global warming potential

- Carbon dioxide 1 kg CO_2-eq
- Methane 28 kgCO_2-eq
- Nitrous oxide 265 kg CO_2-eq

Output

- Live weight
- Carcass weight
- hectare



Average lowland system

System overview	
Stocking rate (ewes/ha)	7.7
Nitrogen use (kg N/ha)	73
Lambing period	March
Lambing rate	1.48
Lamb mortality	7.60%
Weaning rate (lambs/ewe)	1.37
Replacement rate (%)	20
Animal performance	
Birth weight	4.8
Weaning weight	30.7
Drafting weight	45.7
Lamb carcass weight	20.4
Drafted by 1st October	57%
Concentrate (kg/ewe)	103

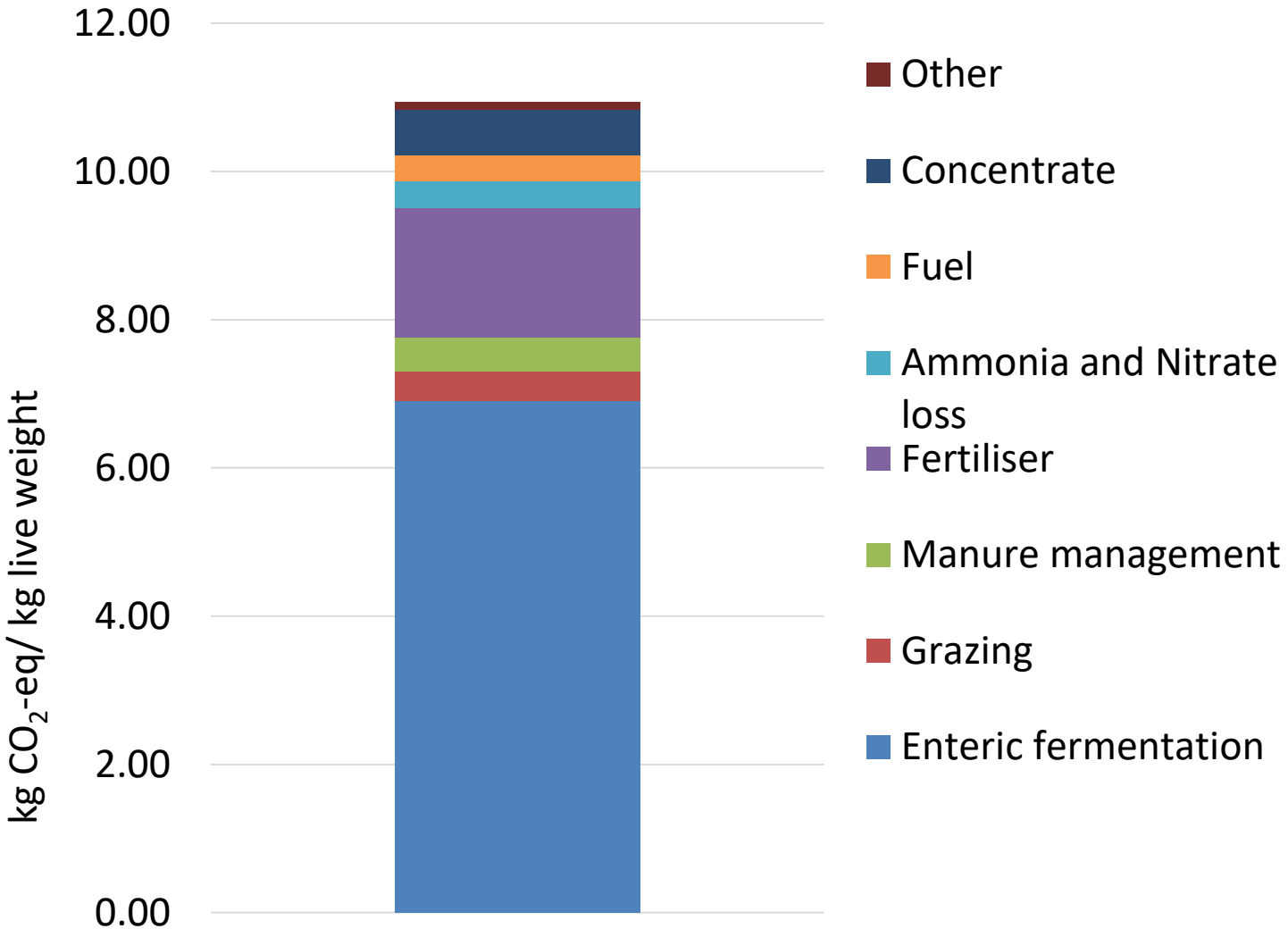
National Average

Average GHG intensity
- 10.8 kg CO_2 eq/kg live weight
- 5,759 kg CO_2 eq/hectare

Methane = 64%
Methane from enteric fermentation dominant source

Nitrous oxide= 20%
Synthetic fertiliser, grazing and manure management

Carbon dioxide = 16%
Concentrate feed production and fossil fuel use

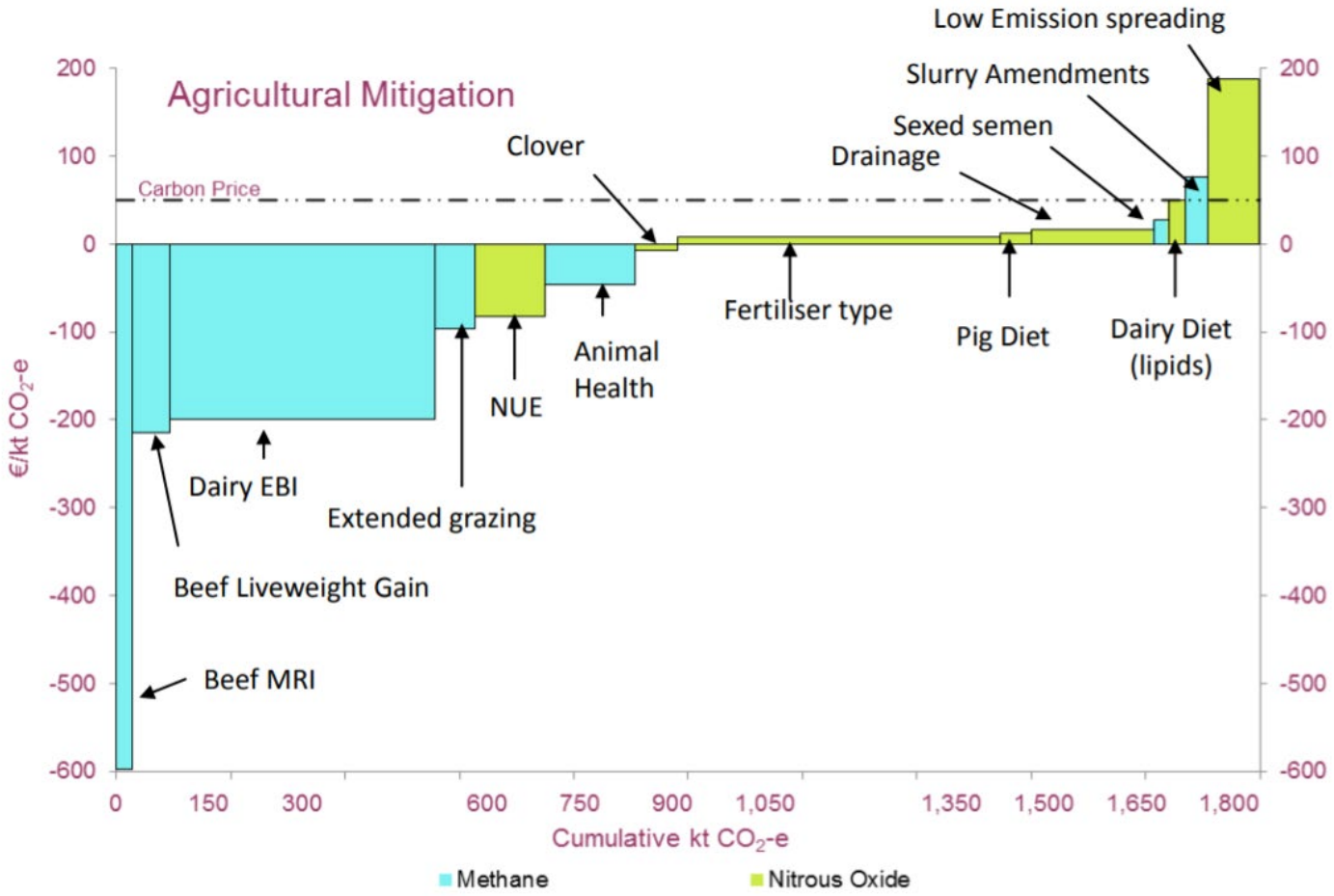


Potential mitigation potential

- **Improve grassland management**
  - Soil fertility
  - Incorporation of white clover into swards
  - Reduce reliance on synthetic nitrogen
  - Reduce need for concentrate
  - Higher daily live weight gain

- **Fertiliser type**
  - Switching CAN for protected urea reduces N_2O emissions

- **Genetic selection**
  - Improve the prolificacy of ewes
  - Higher daily live weight gain



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Future research required

National Inventory uses IPCC tier one methodology for sheep

- May not be representative of sheep in Ireland
- Does not pick up improvements made in system efficiency

Current LCA methodology uses international default emission factors

- May not be representative
- Need to develop country specific emission factors

Further assessment of he effect of management practices