Greenhouse gas emissions from livestock systems: Irish perspectives on a global issue

Paul Crosson
Seminar: Reductions of GHG-emissions from livestock production
Ski, Norway, 7 February 2018

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Presentation overview

- Irish agriculture - an overview

- GHG policy context – global, EU and Irish

- Development of a national GHG mitigation programme
Irish economy has rebounded strongly

- GDP increased 2001 to 2007, decreased during the financial crisis & is now growing rapidly

- Unemployment increased from 4.5% in 2005 to 16% in 2010 and is now at 6%

Source: Central Statistics Office

Agriculture continues to play an important role

<table>
<thead>
<tr>
<th>Key Indicators for Primary and Agri-Food Sectors</th>
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<tbody>
<tr>
<td>% of GVA at factor cost (2014)</td>
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<tr>
<td>2.4%</td>
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<tr>
<td>% of employment (2015 average)</td>
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<tr>
<td>% of merchandise exports (2015)</td>
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</tbody>
</table>

- Agriculture accounts for
  - 24% of industry turnover
  - 22% of industry gross output

Source: Central Statistics Office

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A pasture-based agri-industry

- Cereals, 4
- Sheeps, 4
- Pigs, 8
- Milk & dairy, 30
- Beef & cattle, 39
- Others, 15

Source: Irish Dept Agr, Fisheries and the Marine; Central Stats Office

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Surge in dairy production

- Expansion of dairy herd
- Abolition of quota
- Sucker herd contracting

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Policy Actors

- Limit global temperature increase to 1.5°C
- EU commitment: -40% by 2030 relative to 1990
Policy Actors

Low-carbon strategy for 2050
Targets compared to 1990 levels

Game changer – EU council decision Oct 2014

2.14 the multiple objectives of the agriculture and land use sector, with their lower mitigation potential, should be acknowledged, as well as the need to ensure coherence between the EU’s food security and climate change objectives. The European Council invites the Commission to examine the best means of encouraging the sustainable intensification of food production, while optimising the sector’s contribution to greenhouse gas mitigation and sequestration, including through afforestation. Policy on how to include Land Use, Land Use Change and Forestry into the 2030 greenhouse gas mitigation framework will be established as soon as technical conditions allow and in any case before 2020.
Policy Actors

National Mitigation Plan
Sets out actions for each sector including agriculture

Ireland’s agricultural GHG emissions profile

- Emissions 5%-6% below 1990 levels while output has increased substantially
Specific Challenges for Ireland

- Agricultural emissions account for 45% of non-ETS sector.

Emissions from agriculture projected to be 4%-6% below 2005 levels by 2020 (target -20%).

Land-based solutions?

2050 Carbon Neutrality Report (Teagasc, 2013)

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Absolute or Emissions Intensity

- Total GHG: agriculture accounts for 32% of Irish national emissions (EU = 10%)

- Emissions intensity:
  - lowest dairy and fifth lowest beef within EU

Broader sustainability questions

- "Diet Gap" (West et al., 2014) – human edible calories that does not end up in the food systems
- Land occupation, particularly of grazing animals

Water footprint
Human health considerations

Impact of a reduced red and processed meat dietary pattern on disease risks and greenhouse gas emissions in the UK: a modelling study

- Reduction in DALY equivalent to 1% of health losses
- Savings of over 3% on GHG emissions

Global diets link environmental sustainability and human health

- “…plausible solutions to the diet-environment-health trilemma…”

Public perception?

89% of the members recommended that there should be a tax on agricultural emissions.

Call for radical change in farming methods to tackle climate challenge

- Call for a tax on agricultural emissions.

THE IRISH TIMES

89% of the members recommended that there should be a tax on agricultural emissions.
Government remains committed to agriculture

- **Food Harvest 2020**: increase in milk output 50% & beef value 40%
- **Food Wise 2025**: 65% increase in primary production

National mitigation plan endorses Teagasc's Carbon Neutrality Report

Why grow the Irish dairy and beef industries

- Average supply of ~9 kg/capita & consumption of ~6 kg/capita
- Projected increase of 73% in meat demand by 2050
- Projected increase of 80% in dairy demand by 2050
As a major exporter, “carbon leakage” is likely

Source: FAO

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https://www.youtube.com/watch?v=xtxwfnNwieM
Step 1 – Measure emissions

Farm Quality & Sustainability Assessments

- 45,000 beef farms (90% of beef exports)
- 18,000 dairy farms (100% of milk production)

GHG activity data

National integrated approach

- Department of Agriculture (Animal Inventory)
- Teagasc GHG Model
- Irish Cattle Breeding Federation (Animal performance)
National integrated approach

Department of Agriculture (Animal Inventory)

Activity data

Carbon Assessment

Irish Cattle Breeding Federation (Animal performance)

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Step 2 – Assess economics of mitigation

Marginal Abatement Cost Curve (LCA)

Quality of emissions mitigated

Cost of mitigation

Increased efficiency

Cost neutral

Cost negative

Technical intervention

High cost

Abatement potential (Mt CO₂eq)
Step 3 – Reduce emissions. Carbon Navigator

➢ To mitigate emissions and increase awareness

Practical measures: GHG mitigation and profitable

1. Grazing season length
2. Age at first calving
3. Calving interval
4. Daily live weight gain
5. Nitrogen fertiliser efficiency
6. Manure management

To mitigate emissions and increase awareness

Set targets with advisor

Review current & potential performance

Potential GHG & € benefits

<table>
<thead>
<tr>
<th>Efficiency Measure</th>
<th>Current</th>
<th>Target</th>
<th>Chart</th>
<th>GHG Change</th>
<th>€ Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at first calving</td>
<td>28 mths</td>
<td>27 mths</td>
<td></td>
<td>-0.8%</td>
<td>+502</td>
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Research & Extension critical –
example of dairy industry

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Take home messages

Leverage points for improving global food security and the environment

- Agriculture plays a key role in the Irish economy
- Dairy industry growing; strong commitment to sustainable development with a focus on land use policy
- GHG emissions targets will be challenging – short term will be missed
- Continued commitment to the agri-food sector but...

  “The agricultural sector urgently needs to step up to the plate when it comes to meeting the COP21 targets. Clear and measurable targets will be built into the national CAP action plans, and failure to meet them will result in penalties.”

EU Commissioner for Agriculture, Phil Hogan

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Go raibh maith agaibh

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