THE EU AGRICULTURAL OUTLOOK CONFERENCE

FIT FOR 2030

Resilient EU agri-food systems & rural areas

European Commission

Enhancing the sustainability of livestock production

An Irish Perspective

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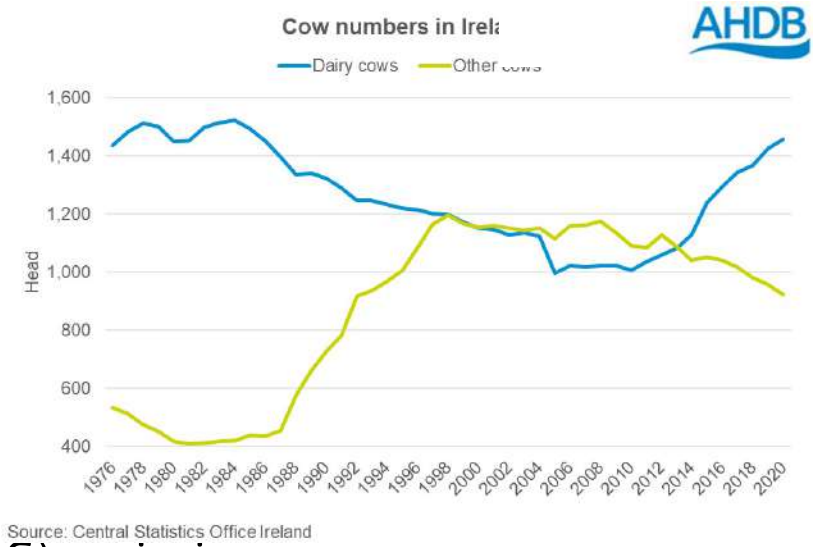
#AgriOutlook

European Commission

Introduction

- Feeding a rapidly increasing global population projected to rise to ca. 9.8 bn by 2050

- Ireland is the **fifth largest beef exporter** in the world
  - **Exporting 85% of all dairy outputs**
- **Total cattle numbers:** 6.5m
  - reduced by 2% in the last three years
- **Pasture** based agricultural system



- **Agriculture** is responsible for 37% of Ireland's Greenhouse Gas (GHG) emissions
- **Ireland: Climate Action and Low Carbon Development Bill 2021**
  - 21-30% proposed reduction in Agri-emissions by 2030

Enhancing economic and environmental sustainability
An overview

1. **Reduce feed costs**
   Enhance feed efficiency
   Exploit compensatory growth
   Maximise the use of pasture

2. **Reduce agri-emissions particularly biogenic methane**
   Enhance farm efficiency
   Breeding strategies
   Feed additives

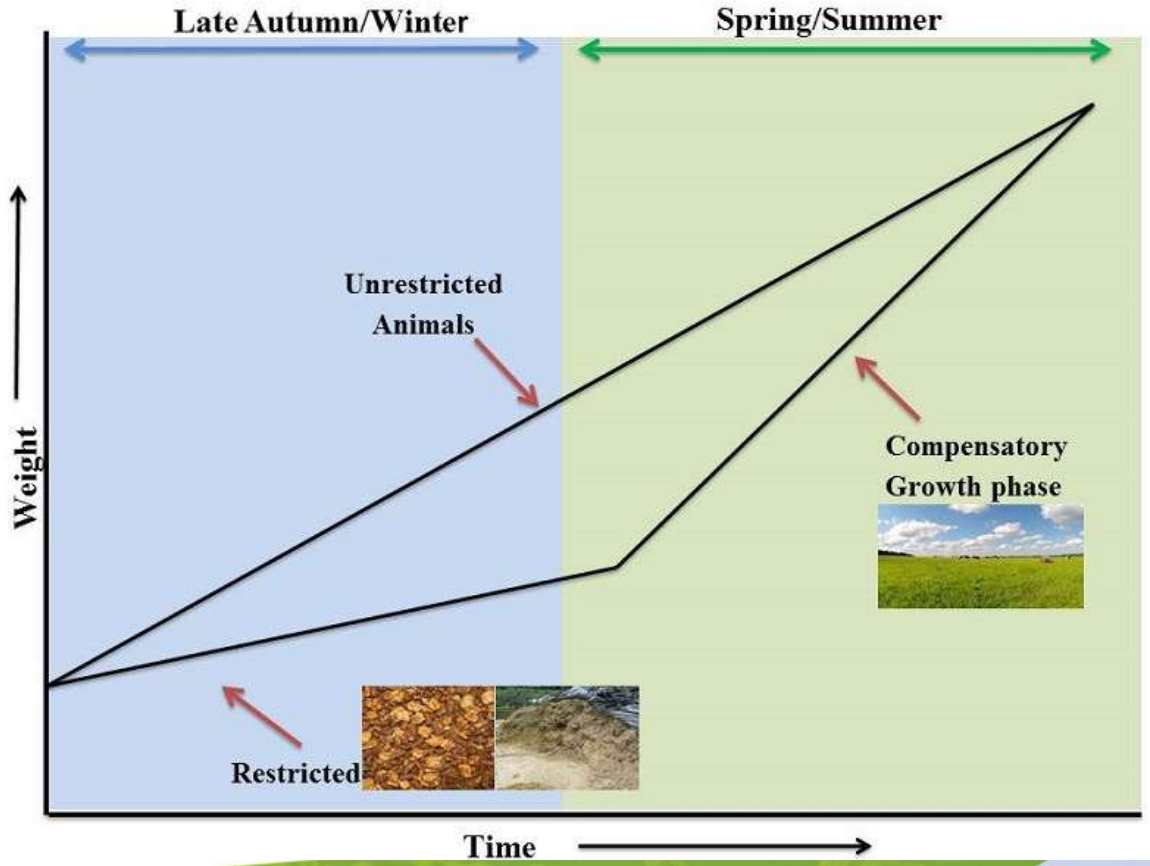
Improving Feed Efficiency

- Feed accounts for up to 80% of the variable costs in beef production
- Measure of the ability of the animal to convert feed into animal product
- Feed intake ↓ Animal Growth ↑ Reduced feed requirement for growth
- More feed efficient cattle emit less methane
- Included in Ireland's genomic selection breeding programme

Lower cost of production
More profit for farmers

Exploiting Compensatory Growth

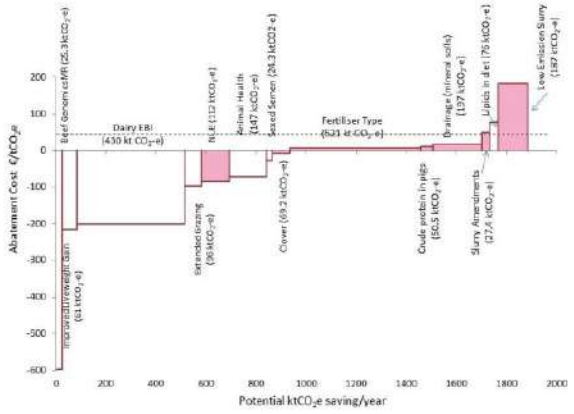
- **Exploitation** of the **compensatory growth** phenomenon in beef production systems
- **Pastoral systems**
  Reducing over winter animal feed costs
- **Incorporation of CG increase net margins by up to €100 per animal**
- Reduces feed costs and **potentially lower GHG emissions**
- **Research:** Breeding animals with a greater ability to undergo compensatory growth



Reduing Agri-GHG emissions

Teagasc Marginal Abatement Cost Curve (2021-2030)
Improved farm management –Cost negative strategies ~ 10% reduction in total GHG emissions

- Extending length of grazing season
- Increasing dairy cow genetic merit via the Economic Breeding Index
- Optimising age at first calving
- Increasing the daily live weight gain
- Optimising the calving and lambing rate
- Lower age at which an animal is slaughtered
- Improved waste management



Putting science into practice

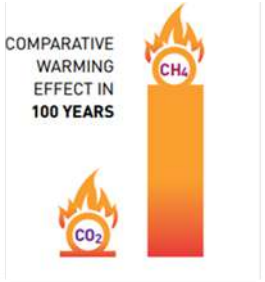
- Farmers “custodians of the land” – **support** to implement GHG mitigation
- **The Signpost Programme** - *Promoting climate action by farmers*
- A **multi-annual campaign** to prompt climate action by all Irish farmers
- Creating more **profitable and sustainable** farming enterprises

SIGNPOST
Farmers for Climate Action

More than 100 Signpost farmers and almost 50 companies and organisations

Development of new technologies to reduce methane emissions

- **Reducing biogenic methane will be key to meeting our EU targets on climate change**
- **Sources of methane from Irish agriculture:**
  - Enteric fermentation (feed digestion) - 56%
  - Stored slurries & manures - 10%



Duffy et al. 2020

- **Two main approaches:**
  - Breeding strategies: Enhance feed efficiency and lower methane
  - Feeding strategies:
    - Feed additives - delivered during grazing
    - Early life supplementation

Breeding strategies to reduce methane emissions

- Inclusion of methane output and feed efficiency in the Irish breeding index
- Long-term solution - Cumulative and permanent
- ***Irish Cattle Breeding Federation (ICBF):*** >600 beef cattle/ year
- Measure feed intake, weight gain, carcass and meat quality traits
- Enteric methane emissions
- All animals genotyped
- First large scale characterisation of methane emissions in Irish beef cattle
- Some beef cattle can produce up to **30% less methane emissions** for the same productivity

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Effect of divergence in residual methane emissions on feed intake and efficiency, growth and carcass performance, and indices of rumen fermentation and methane emissions in finishing beef cattle

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Feed additives to reduce methane emissions from pasture based production systems

‘METH-ABATE’: Feed additives to mitigate methane emissions
Bovaer (3-NOP), seaweeds, oils, halides, yucca extracts, olive feed

Systematic approach – large number screened *in vitro*

Monitoring their effects on **animal productivity** (cattle and sheep)

Mechanism of action – rumen microbiome studies

Encapsulation/slow release options for delivery during grazing

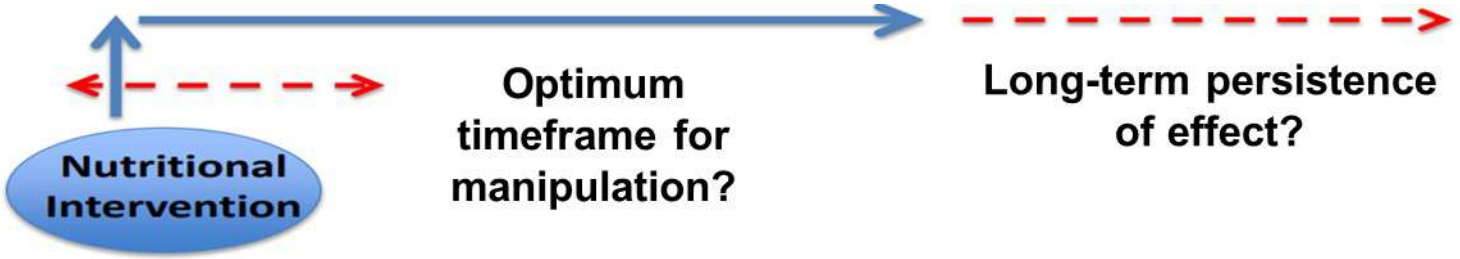
Nutritional and toxicological composition of meat and milk - to confirm **consumer safety**

Sustainability: Life Cycle (LC) Analysis models

Farm level **cost** effectiveness will be evaluated - national farm survey

Early-life Intervention

- **First month of life** presents a time-frame during which the rumen microbiome becomes established



- Lasting effects on rumen functionality including methanogenesis, which can extend into later life
- **Meale et al. (2021)** - Early-life administration (oral dose) of dairy calves with 3-NOP from birth-to-14 weeks of life
- Reduction in methane emissions, which persisted to 12 months of age
- Cumulative reduction of circa 150 kg of CO2eq per head in these cattle during the first year of life

Livestock Research Group of the Global Research Alliance for Climate Change

- ~70 countries: Grow more food without increasing GHG emissions
- Working collaboratively to extend the global knowledge base on livestock GHG emissions
- Capacity building in developing
- GHG mitigation, tier progression in national inventories

GLOBAL RESEARCH ALLIANCE ON AGRICULTURAL GREENHOUSE GASES

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THANK YOU

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