Key Projects from England

- AHDB
- DairyCo
  - Carbon footprinting for GB milk production
- Defra - Green House Gas Platform
  - Data Management (AC0114)
  - Methane Emission Factors (AC0115)
  - Nitrous Oxide Emission Factors (AC0016)
DairyCo R&D project

• Establishment of annual average carbon footprint figure for GB milk production
• The E-CO$_2$ Project were successful tenderers
• Three year project
• Over 400 farms
• Varying in size, system and geographical location
• Good, bad & ugly!
Improving metrics

• Carbon foot printing methodology
• Water foot printing methodology
• Developing LCA approaches
• Improvements to National Inventory
• Linkage to global networks
Farm feedback

Your farm emissions by source.

Your Farm

Average farm

- Enteric Emissions (Methane from the rumen)
- Methane from Manure
- Nitrous Oxide from animal & organic manure & grazing
- Artificial Fertiliser
- Feed Use
- Fuel
- Electric
- Other (bedding, lime, sprays, and natural atmospheric deposition)
Comparison

- **Whole Milk Pool**: 2261 g/l
- **Low yielders 0-6500L**: 2261 g/l
- **Mid-range yielders 6500-9000L**: 2008 g/l
- **High yielders 9000+**: 1398 g/l
- **12 Month housed system**: 1592 g/l

**Your Farm:** 1205

**750 g/l**
Dairy Co, EBLEX and BPEX have plans
Milk Roadmap – supply chain!
Low Carbon Transition Plan

- Targets CO$_{2eq}$
  - 1990 - 34% by 2020 (2008 – 18%)
  - 1990 – 80% by 2050
  - England Agriculture
    - 11% by 2020
  - = 3MTCO$_{2eq}$ pa

Over the next 40 years, the global food system will have to feed more people with less impact. This will mean providing a higher quality diet whilst dealing with greater competition for land, water and energy and the economic and political pressures of globalisation as the climate changes. Our farmers and growers will need to adapt to the changing conditions alongside reducing greenhouse gas emissions. Greenhouse gases are an inevitable consequence of food production, and the challenge of reducing them whilst increasing food production is huge.

Commitment
The Greenhouse Gas Action Plan (GHGAP) sets out how the agriculture industry in England is responding to this challenge. It shows our commitment to playing our part in tackling climate change by reducing our greenhouse gas emissions by three million tonnes of CO$_2$ equivalent per year from 2018-2022. The GHGAP is one of a range of initiatives that are already helping farming produce more whilst impacting less.
– Data Management (AC0114)
– Methane Emission Factors (AC0115)
– Nitrous Oxide Emission Factors (AC0016)
Thank-you!
Aims of Workpackage 3

• GHGE = Emission factor x Activity value

• Activity data values include:
  – Animal numbers, types, ages
  – Feed composition, e.g. energy density, N
  – Housing & manure types & methods
  – Crop areas, types, location (soil-climate)
  – N applications to land (fertiliser & manures)
  – Time grazing or ranging

• Move from set of constants to systems-based approach
A range of data sources have been assessed:

- **Data from Defra:**
  - Farm Business Survey
  - Farm Practices Survey
  - June Agricultural and Horticultural Survey-Census (JASC)
  - British Survey of Fertiliser Practice
  - Straw survey
  - British Cattle Movement Service (BCMS)
  - GB Poultry Register
  - Sheep and goat survey
  - IACS

- **Data from industry:**
  - AHDB Benchmarking data (DairyCo, EBLEX, HGCA)
  - Consultancy data (Promar, Kingshay, AB Sustain, E-CO₂ project)
  - Farm certification data (LEAF, Soil Association database)
Tracking uptake of explicit mitigation measures:

Data gaps in red

- **Base diet change (e.g. use of maize or whole-crop silage concentrate feed rates):**
  - Promar and E-CO$_2$ project data
  - EBLEX business pointers and experts for beef and sheep
    - Use of fat supplements, lower crude protein diet formation

- **Genetic Potential (breed):**
  - BCMS

- **Fertiliser Management:**
  - Use of nitrification inhibitors
  - Use of urease inhibitors

- **Fertiliser Placement:**
  - Percent of fertiliser incorporated or directly placed into the soil

- **Soil Management:**
  - Use of minimum tillage, zero tillage, clover and cover crops: FPS and SAPM
  - Field drainage type and condition
Tracking uptake of explicit mitigation measures:

- **Manure and slurry in storage**
  - Slurry and FYM storage – some limited data in FPS and SAPM – does not describe the type of cover
    - Dairy cattle: daily washing down of collecting yards
    - Active composting, aeration, cooling, solid separation
    - Poultry: Manure drying method (house heat exchange or belt removal)
    - Poultry: use of Alum additives
    - Poultry: incineration of manure
    - Pigs: frequent removal of pig slurry (vacuum pump)
    - Pigs and poultry – use of Air Scrubbers and Bio-Filters

- **Manure and slurry application** - Slurry application techniques (e.g. use of band spreader or injector)

- **Manure and slurry incorporation**
  - Incorporation delay – FPS and SAPM – No detail on method of incorporation (plough, disc or tine)
Gap filling with expert opinion: diets for beef and sheep

Suggestions for industry experts in England and Wales?
Summary:

- Representative detailed dairy data
- Benchmarking data possibly limited by only capturing the more proactive producers
- Limited data on diets for beef (i.e. concentrate only and no CP estimate)
- Limited data on fertiliser, manure and slurry management
- Possible to address gaps through adding questions to national surveys plus expert opinion – your assistance for both of these tasks would be appreciated!
THANK YOU