Written evidence from Dairy UK (MET0035)

Introduction

1. Dairy UK is the trade body that represents the dairy processing sector in the UK. More information can be found at www.dairyuk.org.

2. Dairy provides affordable, safe, value for money nutrition to the British public, via a range of tasty and diverse product options. It accounts for 9% of UK calorie intake and is a vital source of key nutrients for all age groups. At present there are no other food products on the market that can offer consumers the same rich nutrition as dairy, in one affordable package.

3. Dairy UK and the dairy processing sector are committed to improving the entire sector's environmental performance. The Dairy Roadmap is the primary vehicle for achieving this goal. It is a cross-sectoral initiative that is jointly overseen by Dairy UK, the Agricultural and Horticultural Development Board (AHDB) and the National Farmers Union. It sets ambitious targets for environmental improvement for both farmers and processors. This is in addition to the specific initiatives operated by individual dairy processors and retailers.

4. The sector is acutely mindful of contributing to achieving net zero. Through the Dairy Roadmap it has adopted a climate ambition which includes the following commitments:

    - For carbon dioxide (CO2): to achieve at least net-zero emission by 2050 at the latest. This approach must be evidence-led and driven by emissions reduction.

    - For methane (CH4) and nitrous oxide (N2O): to maintain sustained reduction in emissions and to maintain a positive and improving contribution to tackling climate change from 2025 to 2050, with an ambitious target and time plan determined by data and evidence.

    - For F-gases: to eliminate where feasible the use of fluorinated gases within the dairy supply chain, shifting towards natural refrigerants with lower global warming potential (GWP).

5. To track progress, the Dairy Roadmap asks all dairy farmers in the UK to calculate their carbon footprint as soon as possible. It is estimated that approximately 80% of dairy farmers have already met this requirement.

6. New targets are being developed by the Dairy Roadmap. The new 'proposed' targets for emissions are for a 3% reduction per year from a baseline of 2023, and for the provision of data on emissions type and source to be shared from 2024 onwards to track estimated methane emissions and set more specific targets if appropriate.

7. GWP_{100} and GWP* have their merits in assessing the impact of methane emissions and the Dairy Roadmap supports the use of both metrics.

However, the debate over their use should not detract from the responsibility of every sector, including dairy, to seek to make a positive contribution to net zero consistent with the broader requirements of sustainability.

8. Dairy UK also recognises that methane suppressing feed products represent a real opportunity for the sector to meet its greenhouse gas emission commitments and welcomes Defra's investigation of this area in which Dairy UK is participating. However, the use of these products must be subject to the sector receiving credible assurances that they are compatible with animal health and welfare, food safety and quality, and economic sustainability.

11) What are the advantages and disadvantages of available metrics used to report and compare methane emissions including GWP100 and GWP*?

GWP converts all greenhouse gases into their Global Warming Potential as converted to Carbon Dioxide equivalents over a defined period e.g. GWP100 (100 years) therefore assuming all gases behave in the same way as CO2. However, methane behaves very differently from CO2.

- Carbon Dioxide: Carbon dioxide is a stable gas that once emitted persists in the atmosphere contributing to global warming for hundreds or even thousands of years, with removal driven by biological fixation (photosynthesis) or ocean absorption.

- Methane: In contrast, although trapping much larger quantities of heat than CO2, breaks down quickly. On average methane has a half-life of 12 years in the atmosphere, with removal predominately driven by atmospheric OH- radicals (hydroxyl radicals).

  In the dairy sector about a third of a dairy farm's greenhouse gas emissions come from enteric fermentation – largely as methane emitted by the cow, with a further fifth from manure management. Atmospheric CO2, including CO2 produced from the decay of methane, is taken up by the grass to be eaten by cows some of which is turned back into methane, so methane emitted through enteric fermentation is part of a biological cycle – defined as biogenic methane. This biogenic methane, in contrast to the thermogenic emitted from fossil fuel production, is part of a natural cycle and can have a net zero effect on climate change when emissions are balanced with OH- atmospherics removal.

  Interestingly, the life cycle of these two different types of methane affects the removal of methane from the atmosphere through influencing OH- formation. The carbon monoxide, released from fossil fuel burning, linked with thermogenic methane, removes hydroxyl radicals from the atmosphere increasing the half-life of methane, whilst volatile organic compounds produced by grazing animals, associated with biogenic methane, increases the production these radicals via ozone and NOx interactions. Hence it is important to differentiate between Thermogenic and Biogenic methane.

GWP_{100} converts all gases into their CO_2 equivalent. Under IPCC rules methane is assessed as heating the climate 28 times more than CO_2 over 100 years. This compares with a figure of 84 times when assessed over 20 years (GWP_{20}) so the timeframe is important when calculating an average GWP. The use of GWP_{100} implies that net zero emissions of all GHG are required for a predicted stabilisation of global temperatures (net zero warming).

GWP* takes account of the non-linear impact of short-lived greenhouse gases on global warming and converts methane into CO2 warming equivalents. An increase in emission of short-lived pollutants is deemed to have a pulse-effect on CO_2we emissions. This means that if the historic methane emissions from a sector are stable then they will not affect global warming, and if falling, then they will have a cooling effect.

GWP* is much better at predicting temperature response to changes in emissions of short-lived pollutants. As such GWP* correlates better than GWP_{100} with climate models by allowing for differences in the effects of short- and long-lived pollutants on climate, particularly when methane emissions are stable or in decline, which is predicted to have an almost immediate positive impact on global temperature rise.

However, because GWP* calculates the current impact of historical emissions, it requires data from the past 20 years, which is not always available. The impact of historical emissions also means that GWP* doesn't provide a fair platform for comparison between farms.

It is important to separate biogenic and thermogenic methane emissions in calculations and reporting. The IPCC adds one unit of CO2e to thermogenic methane emissions to account for the resultant CO2, whereas CO2 from biogenic methane is omitted due to the expectation that it doesn’t persist in the atmosphere.

The planet’s ability to deal with atmospheric methane is changing. Fossil fuels are both increasing methane emissions and reducing the capability of methane sinks. Carbon monoxide, released alongside CO2 and methane when burning fossil fuels, and also from increasingly prevalent forest fires, reacts with hydroxyl radicals reducing their availability to oxidise methane.

It is important to reduce biogenic methane emissions, but net zero can be achieved by balancing methane emissions with hydroxyl radical availability.

In summary GWP* is more useful for reporting aggregate emissions across sectors and to map global temperature trends and targets, with GWP_{100} better used for benchmarking at farm level. GWP* is impacted by prior management decisions, so whereas it better explains impact on global temperatures, it doesn't provide a fair platform for comparison. Therefore, both should be reported alongside a differentiation of biogenic and thermogenic sources (as the impact on the OH- sink will be different and subsequently will influence the half-life).

Agriculture

16) Are there emerging technologies, such as methane suppressant feed products or approaches to slurry management, that could aid with methane emissions reduction in agriculture? What impact could they deliver?

Methane Suppressing Feed Products

Methane suppressing feed products are an emerging technology that could reduce methane emissions from the dairy sector. They are in an early stage of development and questions remain over their efficacy.

In 2022 Defra, in conjunction with the Devolved Administrations, undertook a call for evidence on Methane Suppressing Feed Products. Dairy UK's response argued that uptake of these products by UK dairy farmers must be subject to the sector receiving credible assurances that they are compatible with:

- Animal Health and Welfare

  The UK dairy sector operates to high and rising standards of animal health and welfare. Consumer confidence in the efficacy of dairy products rests on the industry meeting consumer expectations in this regard. It is therefore vital to the sustainability of the sector that it has complete assurance that the use of these products has no animal health and welfare implications over the entire lifetime of animals fed these products. Currently the available research information is very limited and not sufficient to address this concern.

- Food Safety and Quality

  Equally key to maintaining consumer confidence in dairy products is maintaining the sectors achievement in providing value for money, safe, and nutritious food. This cannot be compromised.

- Economic Sustainability

  The above concerns directly impact on the economic sustainability of dairy farming. Unless suppressors are compatible with farm profitability, then this alone would be an insurmountable impediment to their uptake.

Defra published its summary of the responses to the consultation in October2023 and concluded that:

> *'Defra considers that methane suppressing feed products are an essential tool to decarbonise the agricultural sector. We are committed to working with industry to stimulate the market and encourage uptake of these products'.*

The Scottish and Welsh governments committed to monitor developments. Northern Ireland stated that the use of feed additives would be progressed by collaborative industry research through a research challenge fund.

To address questions over the use of Methane Suppressing Feed Products last year Defra opened a tender for a £9m multi-year research project that asked for a UK wide consortium to establish 'living labs' (i.e. networks of dairy farms) as demonstration platforms to test/showcase the efficacy of methane reducing interventions including MSFP. Dairy UK has joined a consortium bidding for the project with the primary objective of ensuring that the project provides the assurances required for the safe and sustainable use of MSFP. The results of the tender have not yet been declared.

In pursuit of its policy objective Defra has now created a 'Methane Suppressing Products Roundtable' which held its first meeting on the 7th March. The objective of the Roundtable is to report by the end of the year on:

- Barriers to achieving the objective of developing a mature market and the mandate for the use of safe and effective MSFP in suitable cattle systems across England by 2030 which could be addressed by the private and public sectors.

- Ensuring that consumer information about the use of MSFP is proportionately communicated to farmers, supply chain stakeholders and consumers.

- The means to provide assurance that MSFP are safe and effective, are deployed correctly, and contribute to national GHG inventory reporting.

Dairy UK is participating in this roundtable which first met in March. Issues identified included:

- Only one product has so far been authorised for use in the UK: 'Bovaer', which also has EU approval.

- There was no immediately available solution to feeding MSFP in pasture-based systems. Trials in Ireland of feeding MSFP during milking showed that the effect only lasted two hours.

- Farmers would have to receive some form of financial incentivisation/payment to cover costs.

- Trials of MSFP had been undertaken in various countries around the world with diverse results.

- The naturalness of MFSP could impact consumer perception.

- There needed to be a process for validating that MSFP purchased by a farmer was actually fed to animals.

Bovaer has been trialled in the EU by Arla Foods, without any impact on the fat and protein content of milk or on fertility or production. Arla Foods will be trialling Bovaer in the UK.

Defra will be developing an efficacy and validation protocol for MSFP. Work will commence in Q2 this year and would be completed in 2025.

Slurry Management

Technologies for improving slurry management and reducing emissions are well established and would not generally fall under the category of emerging technologies.

Committee question 17) How effective are existing policies and incentives, such as Slurry Infrastructure Grants, in driving methane reduction?

The grant is available to help replace, build additional or expand existing slurry stores to provide 6 months' storage for farmers in England only but a more integrated policy approach that embraces a range of options for improved slurry management is needed.

Whilst the grant assists in reducing methane emission, it is also extremely important in helping the dairy sector meet wider environmental regulatory requirements. Because of the sector's focus on restructuring to maintain competitiveness there is a backlog of investment required by the sector in this area.

Another option for driving methane reduction is on-farm Anaerobic Digestion. Adoption of this technology is strongly influenced by Government policy. The UK's on-farm AD sector grew in the 1990's with Farm and Conservation Grants (1989-95). When the grants ceased in 1995, digester deployment essentially stalled until the introduction of the Renewables Obligation in 2002 and the more generous Feed in Tarriff (FIT) in 2010.

When the Renewable Heat Incentive (RHI) was introduced for biomethane injection, on-farm digester installations started to become much larger, partly to absorb the higher capital cost needed for gas grid injection. Now under the GGSS (Green Gas Support Scheme), most digesters are usually larger than 2 MWe and are permitted to produce up to 50% of their gas from crops in adherence with the feedstock restrictions, skewing the sector towards even larger plants. Also, the GGSS is not available for smaller off-grid AD plants, thereby excluding the majority of dairy farms that are not close to the national gas grid. Overall, this policy framework has resulted in the stalling in rate of investment in AD.

There are strong arguments advanced by the Royal Agricultural Society of England in their 2022 Farm of the Future Report (see www.rase.org.uk/reports/) and a more recent paper on Livestock Manures and On-Farm Anaerobic Digestion that if a framework to support AD viability at micro-scale could be found, then, with modular technology and a mix of grant and GHG emissions incentive support, it could have a major impact on

the dairy sector and its emissions, producing electricity and heat and/or biomethane as vehicle fuel for farm use, as well as offsetting the use of fossil fertiliser, while also improving nutrient management.

However, improving slurry management is only one of a range of options available to dairy farmers to reduce greenhouse gas emissions. Other routes include:

- Improving nutrient and feed efficiency,
- Reducing replacement rates by improving health and fertility,
- Using genetic selection to identify lower emitting animals.

18) What other policy tools, frameworks or incentives could be employed in agriculture to drive methane reduction?

The first requirement is for accurate measurement of emissions by individual farms. The Dairy Roadmap is instrumental in this process. The Roadmap has set the aspiration for all dairy farmers to engage in carbon auditing. As noted above it is estimated that approximately 80% of dairy farmers have already met this requirement.

Work is also being undertaken under the Dairy Roadmap with the providers of the measurement tools used by dairy farmers to standardise metrics to ensure data is collected on a harmonised basis. This is a complex area, but work should be finalised this year.

Accurate measurement then needs to be coupled to a firm understanding of what factors drives emissions on dairy farms and what practical changes can be put in place to achieve reductions without creating unintended consequences. This requires some or all of:

- Innovation through the research and development of a range of tools that could be used by dairy farmers to reduce emission.

- The communication to farmers of these tools through knowledge transfer by the industry development body: the Agricultural and Horticultural Development Board, or through commercialisation by the private sector.

- The provision of appropriate incentive for farmers to use these tools, either through Government policy instruments (aid, grants or regulatory compulsion) or through commercial incentives. These could include reduced costs and greater income for the individual farm (increasing profitability), or from commercial signals from the supply chain.

This is a complex area that requires a flexible and responsive collaborate partnership between Government and the private sector. The one approach that must be avoided would be regulatory compulsion which would alienate farmers and inevitably produce perverse outcomes.

19) How can efforts to mitigate methane emissions in agriculture be integrated into broader approaches to facilitate and incentivise climate and nature-friendly farming practices?

Policy makers also need to be mindful that farming is not amenable to one size fits all solutions. Farming is a complex undertaking and dairy farming is probably the most complex. Farming is dependent on the skills of the farmer, the advisors available to them, weather, topography, assets, labour, capital, profitability and confidence about the future. Harmonising these factors to achieve nature-friendly farming can only be achieved by individual farmers. To ensure farmer engagement and motivation it is important that they are regarded as part of the solution, and not treated as polluters and part of the problem.

Separately from the development of policy approaches, more emphasis should be given to the process of obtaining any change in agriculture. This now fundamentally requires data. For whatever goal farmers seek to achieve or is sought from agriculture in general it is necessary for farmers to:

- measure their current position,
- develop plans with appropriate advice,
- monitor progress,
- share data to enable:
    - the assessment of the sector's position in aggregate,
    - the provision of benchmarking services,
    - development of future solutions.

Recognising the importance of data gathering and digitisation of agriculture is the prerequisite for progress on any agenda.

20) How can efforts to reduce methane reduction be balanced against other important considerations in the agricultural sector, including food security?

Three points:

- Sustainability: It is important that a holistic approach is taken to methane reduction. Emissions reduction must be placed in the broader context of sustainability, which seeks to achieve a balanced reconciliation of economic, social and environmental factors over time. Emissions reduction cannot be given absolute priority over all the other aspects of sustainability. There are trade-offs that have to be made. As an example, a move to fully housed dairy production systems may reduce emissions but at the expense of both soil quality and biodiversity.

- Global context: Greenhouse gas emissions are a problem of the global commons. Any solution to UK emissions that just displaces emission elsewhere must be avoided. The UK dairy sector is one of the most carbon efficient in the world. UK average greenhouse gas emissions for dairy are estimated to be 1.25kg CO2e/kg fat and protein corrected milk (FPCM) (Alltech, 2019). This compares with the global average of 2.5. Global demand for dairy, and dairy protein in particular, is rising. Global food security and greenhouse gas emissions may be better served by an increase in UK dairy

production.

- Carbon credits: Great care needs to be taken over the development and operation of any system of carbon credits. There are myriad problems with their operation, and they could seriously distort the incentives to farmers to engage in food production. This is an area that would warrant a separate investigation by the committee.