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Methane-reducing feed additives

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1 Executive summary

1.1 Aims

In 2019, the Scottish Government set ambitious targets to deliver net-zero greenhouse gas (GHG) emissions by 2045. In 2018, agriculture was responsible for 18% of Scotland's total GHG emissions. More than half of this was attributed to methane (56%) with most methane arising from enteric fermentation (produced during digestion of feed by cattle and sheep). The Government's net-zero target, therefore, creates strong demand for methane-mitigation technologies.

We explored the potential of two close-to-market feed additive products designed to reduce enteric methane emissions. We made a formal assessment of published scientific literature and consulted with product manufacturers and industry specialists to understand product **efficacy**, current and likely future **regulatory status** and the **challenges of practical implementation** on Scottish farms. This summary paper captures the initial findings. Detailed results are currently protected by commercial confidentiality.

1.2 Key findings

- Both feed additives reduce enteric methane emissions.
- However, relatively few data are available from animals fed diets typical of Scottish or UK farming. Incompletely understood interactions between these additives and diet type may result in effects in Scotland that differ, quantitatively, from those reported to date.
- There is some evidence for improvement in animal performance (e.g. milk yield), but the published evidence base is small.
- No product is currently authorised for use as a feed additive to reduce methane emissions. Applications have been made for regulatory approval for use in dairy cows, and it is likely that applications for use in other ruminant animals will follow. Whilst not approved as a methane reducer, one of the additives is being widely used commercially in Scotland.
- The existing animal feed supply chain has the capacity to supply both products to farm, in forms easily combined into current rations.

1.3 Recommendations

1. Further research is needed, using robust methodologies, to quantify methane mitigation in cattle and sheep fed diets commonly used in Scotland, especially long-term experiments using diets based on fresh grass or grass silage. The interaction between the two additives has not yet been studied.

2. There is a need for systems to monetise methane reductions (and provide farmers with an economic incentive) and/or a stronger evidence base for positive effects on animal production (milk yield, growth rate, feed efficiency). Feed additives can reduce enteric methane emissions directly or indirectly by improving animal performance, thereby reducing emissions per unit of milk or meat. Positive effects on animal performance will incentivise use of these additives when there is no direct reward for their use to reduce methane emissions.

3. For any products approved for use in methane mitigation, work will be needed to incorporate them in tools used to calculate on-farm carbon footprints. This will accelerate market uptake once products are authorised for use.

4. Implications for preparation of national inventories and the tracking of progress towards 'net zero' need to be considered.

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