Teagasc Grange – beef

Additives reducing methane emissions

The 'METH-ABATE' project aims to identify additives from a range of sources in order to reduce methane emissions.

Emily Roskam and Sinéad Waters
Teagasc

Emily Roskam

Under the Climate Action and Low Carbon Development Act, the Irish Government has committed to reduce emissions by 51% by 2030. This translates to a 22-30% reduction from agriculture, including a 15-20% reduction in methane emissions.

Teagasc researchers are working with NUIG, Agri-Food and Biosciences Institute; Queens University, Belfast, and a range of industry partners, on the DAFM-funded project, 'METH-ABATE'.

The project aims to develop farm ready technologies to reduce methane emissions from ruminant fermentation, and stored manure/slurry.

The main objective is to develop and validate anti-methanogenic feed additives for pasture-based systems. The research will monitor productivity, evaluate food safety and sensory properties of meat and milk products from animals that are supplemented with the anti-methanogenic feed additives.

Screening additives

Oils, plant extracts, seaweeds, seaweed extracts and halides have been assessed for their methane reducing potential in the laboratory, using a rumen simulation system (RUSITEC).

Methane reductions of two-thirds (67%) were observed when including the tropical seaweed, *Asparagopsis taxiformis,* at 1% of dry matter fed. Comparable results of 50-80% reductions were also observed from the inclusion of differing formulations of the novel halide product being developed by NUIG and industry partners.

Animal studies

Promising feed additives from the lab scale study were assessed in a sheep trial at Teagasc Athenry.

Cull ewes were fed ad-lib silage plus 0.5kg concentrates, which included one of six dietary additives; a brown seaweed – *Ascophyllum nodosum*, a brown seaweed extract, halides, soya oil, garlic extracts and a blend of essential oils.

Methane was measured using portable accumulation chambers, a closed circuit respiration chamber. A trial has also been completed feeding 3-NOP to beef animals in Teagasc Grange with very promising results.

A subsequent beef trial in Teagasc Grange in dairy beef bulls will assess a brown seaweed, *Ascophyllum nodosum*, a brown seaweed extract, linseed and rapeseed oil and halides.

Methane will be measured throughout the experiment using the Green-Feed system, which is a free standing machine. Trial work will be carried out in Teagasc Moorepark, assessing the overall most promising feed additives at pasture in 2023.

To complement this work, additives for methane reduction from manures and slurries are being developed and tested in NUIG.

Animal productivity (growth rates, feed intake, milk yield and health) are being monitored during all animal studies to ensure there are no negative implications of supplementation on performance.

Samples of meat and milk are being collected at slaughter to analyse for any residues, as well as change in taste/texture. On-farm cost effectiveness analysis will be conducted for all potential methane mitigation technologies.

Most trial work so far has been carried out in indoor systems using TMR diets. Our future goal is to assess slow release feed additives, already assessed in-vitro which, following administration to the animal, will release the active anti-methanogenic compound slowly over time.

All research is directed towards practical solutions for farmers.

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