**RRES Press Release 3rd February 2025 significant potential to reduce carbon footprint of beef cattle**

***Study finds that, depending on the mitigationintervention, climate change impacts of UK grass-based beef cattle could be reduced by up to 26%***

Reductions in greenhouse gas emissions of up to 26% are possible within current grass-fed beef farming simply by making changes to existing management practices, according to a new study. Several different interventions were modelled: adopting nitrification inhibitors could reduce the carbon footprint of beef production by 7.5%, while the introduction of nitrogen-fixing leguminous white clover could lead to a 12% reduction. The most effective intervention was anaerobic digestion of cattle manure, which could reduce emissions by as much as 26%.

The study also modelled a reduction of livestock density by 50%. This scenario showed the greatest climate change environmental impact, but in a negative direction. The carbon footprint per weight gain under the livestock reduction scenario was increased by 24.5%, compared with the baseline. This is because the emissions related to the soil remained the same, while the production was reduced.

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In the UK, agriculture is responsible for around 10% of national greenhouse gas emissions, with livestock production accounting for roughly 56% of that total. The study focused on beef cattle, which alone represent 30-40% of livestock emissions.

“We believe there is significant potential to reduce the carbon footprint of beef farming simply by adopting some or all of these interventions,” said Rothamsted’s Asma Jebari who led the study. “Our findings also underscore the importance of considering emissions beyond the farmgate, and reporting on soil organic carbon when evaluating the environmental impact of farming practices.”

While these measures offer progress on climate change mitigation, researchers stress the need for further analysis and field trials to assess their long-term feasibility and effectiveness.

The study was undertaken using data from Rothamsted’s North Wyke Farm Platform in Devon, which is a multi-instrumented and measured farmlet with 30 head of cattle.

Publication

Jebari, A., Takahashi, T., Lee, M.R.F. *et al.* Carbon footprints of greenhouse gas mitigation measures for a grass-based beef cattle finishing system in the UK. *Int J Life Cycle Assess* (2025). <https://doi.org/10.1007/s11367-025-02428-9>