# Tackling the 'Moothane' problem - cutting greenhouse gas from livestock

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A new collaboration between scientists, engineers, industry and farming experts hopes to demonstrate how clever technology can reduce the powerful greenhouse gases released by livestock to help agriculture reach carbon emissions targets.

Methane, released when livestock belch and pass wind, is about 30 times as effective as carbon dioxide in trapping heat over a 100 year timescale.

The methane released by animals such as cows accounts for about 50 per cent of agricultural greenhouse gas emissions and represents a major barrier for the farming sector to meet net zero targets.

The new project, a collaboration between Durham University, sustainable technologies leader Johnson Matthey, University of Nottingham and NFU Energy, will test the feasibility of catalytic equipment to safely decompose methane in barn air, where it is most concentrated and preventing it from being released into the wider atmosphere.

The £250,000 project, partly funded by UKRI's Farming Innovation Pathways funding grants, will build on existing technology and look specifically at how to adapt this to the agricultural sector.

If successful, the team hopes that this could pave the way for a new "farm-ready" technology which could have a significant impact on reducing the greenhouse gas emissions of livestock farming.

Dr Simon Beaumont, Associate Professor in Chemistry at Durham University, said; "Methane from livestock – or 'moothane'– accounts for about 50 per cent of greenhouse gas emissions from the agricultural sector, and around one third of this is released indoors.

"So, whilst 'moothane' is a significant challenge for the farming industry, there is also a real opportunity to solve this challenge and in doing so, help this industry take a big step towards carbon-reduction."

The project brings together experts from academia and industry to take a multidisciplinary approach to tackling the 'moothane' problem.

Johnson Matthey, a global leader in sustainable technologies, has existing methane-catalyst technology (COMET ® technology), for use within underground mining operations, which they hope to re-configure through this project to help address the needs of the livestock farming industry. The concentration of methane emitted in the ventilation air from mines is low, typically less than 1%, which makes performing any useful chemistry challenging. The concentration of methane in dairy barns is even lower than air from mines, presenting even greater technical challenges.

"Emissions associated with the production of beef and dairy products are too great to be ignored as the world moves towards net zero. To make an impact, we need to find how we can reduce the associated methane from cows burping. Contrary to popular belief, most methane does not come from the back end of livestock," explains Andrew Scullard, Principal Scientist at Johnson Matthey.

Johnson Matthey's primary role is to develop advanced materials for the abatement of moothane, building on expertise from the team responsible for the COMET® technology. JM will work closely with the NFU to better understand the farming industry, market potential and drivers for change.

"This is a great example of JM innovation and collaboration, both internally between teams and with our external partners to drive change for a cleaner, healthier world."

Durham University's departments of Chemistry and Engineering will be leading on testing the catalysts within this existing technology, to understand if the technology can work in cattle barns where the methane in the air is very diluted. The University's experts will also investigate what impact other variables, such as barn design, time of year and other components in barn air, may have.

Experts from University of Nottingham will assess the financial viability and overall climate impacts of deploying catalytic technologies to manage livestock methane emissions in the UK.

As a leading energy consultancy with a particular focus on agriculture and horticulture, NFU Energy will be bring specialist knowledge around industry and market constraints to the project.

The hope is that by combining expertise from industry and academia, this project will help accelerate progress towards a potential solution that can be easily deployed by farmers to help reduce the climate impacts of livestock farming.

**ENDS**

**MEDIA INFORMATION**

**Interviews**

To arrange an interview with Dr Simon Beaumont please contact Durham University Marketing and Communications Office for interview requests on communications.team@durham.ac.uk.

**For further information on Johnson Matthey, please contact**
Rebecca Williams: jmpr@matthey.com 0207 269 8001

**Useful web links**

Dr Simon Beaumont; https://www.dur.ac.uk/directory/profile/?id=10598

Department of Chemistry, Durham University;
https://www.durham.ac.uk/departments/academic/chemistry/

Department of Engineering, Durham University;

https://www.durham.ac.uk/departments/academic/engineering/

Johnson Matthey; https://matthey.com/en

University of Nottingham; https://www.nottingham.ac.uk/

NFU Energy; https://www.nfuenergy.co.uk/

UKRI Farming Innovation Pathways; https://www.ukri.org/opportunity/farming-innovation-pathways-fip-industrial-research/

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Durham University is a globally outstanding centre of teaching and research based in historic Durham City in the UK.

We are a collegiate university committed to inspiring our people to do outstanding things at Durham and in the world.

We conduct boundary-breaking research that improves lives globally and we are ranked as a world top 100 university with an international reputation in research and education (QS World University Rankings 2022).

We are a member of the Russell Group of leading research-intensive UK universities and we are consistently ranked as a top 10 university in national league tables (Times and Sunday Times Good University Guide, Guardian University Guide and The Complete University Guide).

For more information about Durham University visit: www.durham.ac.uk/about/

**About Johnson Matthey**

Johnson Matthey is a global leader in sustainable technologies that enable a cleaner and healthier world. With over 200 years of sustained commitment to innovation and technological breakthroughs, we improve the performance, function and safety of our customers' products. Our science has a global impact in areas such as low emission transport, pharmaceuticals, chemical processing and making the most efficient use of the planet's natural resources. Today about 15,000 Johnson Matthey professionals collaborate with our network of customers and partners to make a real difference to the world around us. For more information, visit www.matthey.com

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The University of Nottingham is a research-intensive university with a proud heritage. Studying at the University of Nottingham is a life-changing experience, and we pride ourselves on unlocking the potential of our students. We have a pioneering spirit, expressed in the vision of our founder Sir Jesse Boot, which has seen us lead the way in establishing campuses in China and Malaysia - part of a globally connected network of education, research and industrial engagement. Ranked 103rd out of more than 1,000 institutions globally and 18th in the UK by the QS World University Rankings 2022, the University's state-of-the-art facilities and inclusive and disability sport provision is reflected in its crowning as The Times and Sunday Times Good University Guide Sports University of the Year twice in three years, most recently in 2021. We are ranked eighth for research power in the UK according to REF 2014. We have six beacons of research excellence helping to transform lives and change the world; we are also a major employer and industry partner - locally and globally. Alongside Nottingham Trent University, we lead the Universities for Nottingham initiative, a pioneering collaboration which brings together the combined strength and civic missions of Nottingham's two world-class universities and is working with local communities and partners to aid recovery and renewal following the COVID-19 pandemic