

The Spark

Science news from the Scottish
Environment, Food & Agricultural
Research Institutes (SEFARI)

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*Science that shapes Scotland's land, food and future;
the latest from the Scottish Government's ENRA
strategic research programme.*

SEFARI and the Food and Drink Sector: On the Path to Net Zero

The Rowett Institute and Scotland Food & Drink Partnership's Net Zero Programme hosted an event at this year's Royal Highland Show as food and drink sector leaders gathered to talk frankly about the sector's route to net zero – and the people, partnerships and evidence needed to get there.

Gillian Martin, Cabinet Secretary for Climate Action and Rural Affairs, opened the discussion by welcoming the latest update on the sector's Climate Transition Plan. She stressed its ambition, but

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also its scale: this is a whole industry effort. That point was echoed by Iain Clunie, Programme Director for the Scotland Food & Drink Partnership's Net Zero Programme, which is coordinating and delivering the Plan. He underlined that meeting Scotland's legal net zero target will demand coordinated action across the supply chain, backed by robust science provided by SEFARI.

Standing alongside him, Jules Griffin, Director of the Rowett Institute and Chair of the Programme's Scientific Advisory Group, set up by SEFARI Gateway, spoke to the innovations already emerging from the research world—tools and approaches that could help agriculture cut emissions without cutting corners.

The conversation didn't stop at Scotland's borders. Alistair Carmichael MP, Chair of the Environment, Food & Rural Affairs (EFRA) Committee, and Andrew Muir, Northern Ireland's Minister of Agriculture, Environment and Rural Affairs, (pictured below inset) both joined the event – a reminder that climate transition in food and farming is a challenge shared across all four nations, and one best tackled together.



Main picture left to right Jules Griffin, Iain Clunie and Gillian Martin MSP.
Inset left to right Alistair Carmichael MP and Andrew Muir.

A Vaccine Lost, A Vaccine Rebuilt: Tackling Louping ill in Scotland

Louping ill is a small tick bite with big consequences. This viral neurological disease strikes sheep and red grouse hardest, but it doesn't stop there—other animals, and even humans, can fall victim too. For years, a single vaccine kept the disease in check. Then it vanished from the market, leaving farmers and land managers exposed to a threat they had no way to fight.

Moredun Research Institute stepped into that gap, teaming up with industry partners to build a replacement from the ground up. Early backing came from the Scottish Government's Strategic Research Programme, followed by funding from Scottish Estate Owners via the Game and Wildlife Conservation Trust. From there, momentum grew: a collaborative fundraising drive spanning farmers, grouse estates, and government bodies has now raised over £1 million, with the Scottish and UK Governments both lending support.

That funding has already set pilot-scale vaccine production in motion. The next milestone is regulatory approval, targeted within two years—though reaching commercial production will require a further £1.2 million.

Further information: <https://moredun.org.uk/donate-louping-ill>



Uneven Ground: The Slowing Pace of Community Land Ownership in Scotland

Scotland's appetite for large-scale community land ownership shows no sign of fading, but the slowing pace of new acquisitions tells a more cautious story. The Highlands and Islands account for over 75% of acquisitions and 94% of hectarage, while much of the rest of Scotland has seen little movement. Recent acquisitions in Orkney and Dumfries and Galloway hint at a broader footprint, alongside a shift from crofting estates to nature reserves and other land uses.

This SEFARI Gateway Fellowship by the University of Highlands and Islands traces the slowdown to overstretched communities, fragile local buy-in, scarce and restrictive funding, overcomplicated legislation, dependence on willing sellers, and shared caution around risk.

Suggested solutions include strengthening institutional support, promoting past successes, simplifying legal routes, expanding options short of full ownership, and widening funding access—practical steps to unlock community ownership wherever ambition already exists.



Reading Nature's Code: A Route Map for Scotland's eDNA Future

Every drop of water, handful of soil, or breath of air carries hidden clues about the health of Scotland's environment. Environmental DNA (eDNA) technology can now read these clues—detecting species and tracking ecosystem change faster, more cheaply, and more comprehensively than traditional survey methods.

This matters because Scotland's ecosystems, which underpin clean water, food production, climate regulation, and cultural value, face mounting threats from pollution, invasive species, land and sea use change, resource overuse, and climate change. Better monitoring is essential to track these pressures, meet legal obligations, and build the evidence base for conservation and restoration.

Scotland already has the scientific expertise and collaborative networks to lead in this field—what's missing is coordination. This [SEFARI Gateway fellowship](#) by The James Hutton Institute fills that gap with a strategic route map, charting how investment, infrastructure, and coordinated action over the next two to ten years could position Scotland as a UK leader in DNA-based environmental monitoring, aligned with international best practice.



Sampling DNA from the environment (eDNA), such as on this freshwater filter, enables downstream detection and identification of a broad range of organisms from mammals, fish, insects or microbial pests and pathogens all on the basis of their DNA barcodes. Photo credit: David Cooke, The James Hutton Institute.

The Resistance Trail: From Livestock to Lettuce

Antimicrobial resistance doesn't respect boundaries—it travels through livestock, soil, water, and ultimately, onto our plates. SRUC's research traces how antimicrobial resistance (AMR) moves through livestock systems and the wider environments they touch.

Spanning pigs, cattle, sheep, and poultry, alongside grazing land, manure-treated fields, and neighbouring habitats, the project has built a world-leading dataset on AMR gene diversity across Scotland's livestock system. Researchers have also identified plasmids—mobile genetic elements that carry AMR genes—revealing a plausible pathway for resistance to spread between animals, soil, and the environment.

The trail doesn't end on the farm. A key concern is how AMR might reach people through fresh produce irrigated with water containing resistant bacteria. The team built a model estimating the likelihood of AMR-carrying *E. coli* passing from contaminated water to consumers, showing a high probability of ingestion where produce is affected. While health consequences remain uncertain, the findings point to a credible route feeding the wider AMR burden.

