

PRESS RELEASE

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- £5M hub to aid precision breeding of future farm animals
- Research exploring the use of genetic selection and genome editing tools to develop healthier and more productive farmed animals has received a major funding boost.
- Edinburgh experts will receive almost £5 million to establish a new hub at the University's Roslin Institute, based at the Easter Bush campus, to drive advances in engineering biology – a major innovation focus for the UK Government.

The hub will focus on research to identify and study small changes to DNA in animals to advance sustainable agriculture and control diseases.

Experts say the technology is crucial to transform food systems, as farmers across the globe grapple with challenges linked to the acceleration of climate change and emergence of new diseases.

The five-year funding comes from the UKRI Biotechnology and Biological Sciences Research Council (BBSRC), Gates Foundation, The Roslin Foundation and the University as part of the Edinburgh & SE Scotland City Region Deal.

Engineering biology – making targeted changes to DNA in a lab – allows scientists to rapidly introduce beneficial traits in plants and animals, which can take decades to achieve through traditional breeding programmes.

One focus for the research team will be investigating genetic traits linked to milk production in cattle. Cows produce large volumes of the greenhouse gas methane during digestion. When milk production is high, fewer cattle are needed, helping to cut emissions. This is particularly important in low-income countries, which often rely on breeds with lower milk yields.

Scientists will also explore how small changes to DNA could help to protect animals from disease. Previous research from the University used gene editing techniques to successfully alter a single gene in pigs, making them resistant to porcine reproductive and respiratory syndrome – the costliest infectious disease affecting pigs worldwide.

The hub's research team will develop artificial intelligence (AI) tools to tackle more complex genetic traits in animals, involving multiple genes. AI will help select potential genetic targets and identify which sections of DNA to edit.

This will include resistance to bird flu, which has had a devastating impact in both farmed and wild bird populations worldwide. Efforts to control the spread of the disease are urgently needed, experts say.

The University of Edinburgh is a world-leader in engineering biology, hosting the largest and most comprehensive group of researchers in the UK.

Edinburgh has more than 100 Principal Investigators leading research in the discipline, investigating its potential to create new products and services in areas such as human gene therapy, farming, and industrial processes.

Professor Mark Stevens, co-lead for the hub at the University's Roslin Institute, said:

“The hub will harness Edinburgh's unique infrastructure, resources and expertise in engineering biology for farmed animals. We aim to share this with collaborators across academia and business to explore how animal production could be improved to develop more sustainable food systems.”

Professor Anne Ferguson-Smith, BBSRC Executive Chair, said:

“Engineering biology harnesses nature's processes to generate new products and applications addressing urgent global challenges in food security, health and climate resilience. This investment reflects BBSRC's commitment to supporting transformative research that deepens our fundamental understanding of biology and accelerates the responsible application of innovative technologies. Thanks to support from the Gates Foundation and Roslin Foundation, we are building a powerful collaboration that helps maximise the value and impact of our collective investments. The new Edinburgh hub will position the UK at the forefront of efforts to sustainably enhance livestock production and improve animal welfare, benefiting both the UK and the world.”

Suzy Purcell, Chief Operating Officer at The Roslin Foundation, said:

“As a charity dedicated to advancing animal welfare, sustainable agriculture, and biomedical innovation, we are proud to support this transformative hub. Its pioneering work in gene editing and AI holds great promise for improving livestock health and productivity while promoting more ethical and resilient food systems.”

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