PROJECT MANAGEMENT GLOBAL
The Place for People in Projects

Industry Collaboration Launches Project to Transform Livestock Waste into Sustainable Fertilizer and Carbon Sequestration

April 1, 2025

A consortium of industry experts, including Kairos Carbon Limited, Cranfield University, Royal Agricultural University, and the UK Agri-Tech Centre, has initiated a project aimed at revolutionizing livestock waste management. The "Nutrient Utilisation and Recovery through Supercritical Extraction" (NURSE) project, funded by Defra's Farming Innovation Programme and delivered in partnership with Innovate UK, will develop advanced hydrothermal technology to recover valuable nutrients from livestock waste while simultaneously sequestering carbon.

The project addresses the challenge of managing the UK's annual 140 million tonnes of livestock waste, much of which is spread on farmland with limited nutrient uptake. By formulating non-leaching fertilizers, NURSE aims to enhance nutrient absorption by crops, reduce farmers' fertilizer costs, and minimize resource waste.

"It is critical that we find ways to turn wet organic wastes from a problem into a resource," said Megha Raghavan, CEO of Kairos Carbon Limited. "This technology has the potential to prevent environmental contamination, fight nutrient depletion and remove billions of tonnes of carbon dioxide from the atmosphere, making it a powerful tool in the fight against climate change."

The technology offers multiple benefits, including:

- Recovering critical materials from livestock waste for targeted use as sustainable fertilizer.
- Improving waste management and processing.
- Destroying organic pollutants.

- Extracting carbon for capture and storage, with energy-neutral operation.

The project directly supports UK environmental objectives by reducing emissions, preventing water and air pollution, and improving nutrient management. Kairos' analysis indicates the technology can be implemented profitably across UK livestock waste sources.

"Manure is an invaluable source of on-farm nutrients in livestock systems, but it is not without its challenges," stated Charlie Bowyer, farm technology specialist at the UK Agri-Tech Centre. "Technologies to effectively process manures to eliminate storage issues whilst adding value by concentrating or stripping nutrients are sorely needed and this project takes a step towards developing a fascinating process to achieve just this."

Furthermore, the project is expected to generate hundreds of skilled jobs in farming, agronomy, and chemical engineering. The technology's application can also be expanded to other sectors, including sewage sludge and municipal waste management, maximizing its environmental and economic impact.