Moredun
The Moredun Foundation
News Sheet Vol. 8 | No. 4 | November 2024

# Environmentally Sustainable Livestock Farming

Environmentally-Sustainable Livestock Farming Working Group (ELF)

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# Introduction

Professor Tom McNeilly,
Scientific Director & Chief Executive

This news sheet focuses on regenerative agriculture and a new working group established and coordinated by Moredun. The term 'regenerative agriculture' means different things to different people, but for us, it's about practical, profitable and sustainable methods that make sense for your land and livestock. That is why Moredun have created the Environmentally-Sustainable Livestock Farming (ELF) working group—to focus on approaches that improve animal health, welfare, and environmental outcomes.

The working group brings together farmers, vets, SQP's, researchers and policymakers, each with their own views on how regenerative agriculture can benefit farming. From a scientific perspective, the evidence around the win-wins, unintended consequences and practicalities of widescale adoption of approaches considered regenerative agriculture is scarce and there is a clear role for Moredun to help fill these gaps.

With your support, I hope to see Moredun expand our research into these vital areas and, over the longer term, to develop a platform that explores profitable, nature-friendly livestock farming practices on a larger scale. The working group is another step closer on this exciting journey.

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Agriculture faces critical climate change, biodiversity loss and food insecurity challenges. There has been an upsurge in interest in "regenerative agriculture", which is considered a promising pathway to continue to meet future food demand while protecting and enhancing the environment. Regenerative agriculture means different things to different people, but generally encompasses the following five key principles, to:

1. Increase biodiversity
2. Reduce soil disturbance
3. Maintain soil cover
4. Keep living roots in the soil
5. Integrate grazing animals into the farmed landscape

Despite the proliferation of regenerative agriculture discussions, there is a lack of robust scientific evidence to support the range of observations, case studies and anecdotes circulating in the media and farming press. The recent rise in input costs has made some farmers rethink their farming practices, while regenerative approaches are gaining support from consumers, policymakers, and governments.

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Moredun is a trusted broker with long-standing engagement with livestock farming communities and is in an ideal position to help pivot research and to place livestock health and welfare at the centre of how regenerative agriculture addresses the biodiversity, climate change and food security issues that we currently face. Livestock health and welfare provide the foundations on which any sustainable livestock enterprise is built, and without that in place performance and profitability are compromised.

Over the last few years, Moredun has engaged with the regenerative agriculture community, leading to the co-construction of Moredun-led research projects. These projects are at the halfway point of their five-year cycle and updates detailing their progress are covered later in this briefing.

Towards this end, Moredun has set up a working group of researchers, farmers, vets, SQP's, and policy representatives, who are actively working in the regenerative agriculture area. The remit of the group is:

1. To identify knowledge gaps in animal health and welfare within regenerative agriculture systems and co-develop research activities with Moredun and other research partners to address these gaps
2. To ensure that the farming community has access to independent and robust scientific research to underpin their decision-making

# What does Regenerative Agriculture mean?

The inaugural meeting was held at Moredun on 17th September 2024, with 31 participants attending in person and online. Prior to the meeting, group members were asked about their views on "regenerative agriculture," key challenges, and knowledge gaps. Unsurprisingly, the term "farming" was the most common descriptor, with frequent references to soil quality and integrating natural processes. Key challenges included defining what regenerative agriculture means, the lack of scientific evidence to support its methods and changing the way people manage their land. Specific knowledge gaps highlighted were managing parasites, integrating grazing, connecting ecosystems with animal health and education.

A survey of around 100 attendees at NSA Scotsheep and the Royal Highland Show in June 2024 revealed mixed views on regenerative agriculture. Over 45% of Scotsheep respondents felt it was a continuation of traditional practices, while 25-30% at the Royal Highland Show saw it as essential for a healthy rural landscape, though some doubted its commercial viability for their own farms.

Opinions on regenerative agriculture's viability and purpose may vary, with some seeing it as essential for sustainability and others perceiving it as incorporating practices that have been done before. If you have any thoughts on this topic then we would love to hear from you. Your input will guide our efforts to ensure that the methods we recommend are not only environmentally sustainable but also commercially viable for your farms.

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## What did the Working Group recommend?

To avoid division, regenerative agriculture should be presented as part of a broader sustainable food system. The working group should focus on livestock grazing and integrated systems, as animal health and welfare are central to any sustainable livestock enterprise. While regenerative agriculture draws on traditional low-input methods, it must be informed by modern science and technology to meet today's challenges.

Regenerative agriculture is adaptable, allowing farmers to choose practices that best suit their operations while aligning with core principles like enhancing biodiversity, carbon sequestration, and soil health. Many farmers may already be using regenerative methods without realising it.

The working group should engage diverse stakeholders, such as supermarkets and educators while being mindful of potential 'greenwashing.' Moredun must address knowledge gaps, especially around animal health in regenerative agriculture. Education and peer-to-peer learning are essential to help farmers integrate regenerative principles, with a focus on balancing environmental goals and commercial viability. Revising messaging strategies to share practical success stories will support this transition. An independent body could help monitor assurance schemes and ensure genuine support for regenerative practices.

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## What research is Moredun doing?

The next steps for the working group involve gathering input from members, refining research priorities, and exploring potential funding opportunities. As the group moves forward, it aims to align research efforts with practical farming needs. In parallel, Moredun's current research is providing more evidence for informing regenerative agriculture practices. The following sections detail the progress made in Scottish Government-funded research projects focused on balancing animal health, biodiversity, and environmental sustainability. Please note that this research is a work in progress, and any results presented are provisional; they may be refined or revised as additional evidence is gathered.

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## Improving livestock productivity and sustainability through management and genetics

### Evaluating fluke risk under agri-environment schemes

Research focuses on fluke risk and conservation grazing, as there is the potential for agri-environment schemes to unintentionally put livestock at greater risk. By exploring fluke risk under different scenarios, it appears possible to manage biodiversity and animal health and welfare through careful monitoring.

### Optimising Pasture Management and Grazing for Sustainable Parasite Control and Livestock Health

A large field trial at Moredun's Firth Mains Farm is studying how regenerative grazing strategies affect parasite burden in 120 lambs over four years. It tests various grazing strategies and sward compositions, aiming for more biodiverse pastures and rotational grazing to reduce roundworm treatments, increase weight gain, lower faecal egg counts, enhance immune responses, and improve infection tolerance. However, establishing the biodiverse swards has been challenging. Discussions with Rothamsted Research are ongoing to explore soil biodiversity, potentially leading to dung beetle traps next year.

## Strategies to promote sustainable parasite control and reduce anthelmintic usage

Wormers and flukicides used to control roundworms and fluke can negatively impact invertebrates such as dung beetles, flies and aquatic fauna if they encounter dung/urine of treated animals or if unused products are not disposed of correctly. To address these concerns, Moredun is working with industry groups such as Sustainable Control Of Parasites of Sheep (SCOPS) and Control Of Worms Sustainably (COWS), and Veterinary Medicines Directorate (VMD) to develop key messages about best practices.

Moredun researchers are exploring Targeted Selective Treatment (TST) methods to optimize wormer treatments while minimising environmental impact, along with the role of dung beetles and their mites in controlling worms directly (or indirectly). They are also investigating how long anthelmintic residues remain in manure after treatment, which varies depending on the chemical's excretion, metabolism, and environmental breakdown.

Additionally, agri-environment schemes may unintentionally increase tick risks through practices like afforestation and reduced bracken control. However, these interventions can also lower parasite challenges and treatment needs. For example, designated wetland habitats can be grazed only during specific low-risk intervals, offering potential benefits.

Another part of this ongoing study is treating animals with anthelmintics and exploring the faecal matter to investigate how anthelmintics affect the attractiveness of faeces to invertebrates. Anthelmintics may impact the development and reproductive success of invertebrates, but equally, faeces containing anthelmintic residues can be highly attractive to invertebrates. It has been a cold, wet summer, which will have impacted invertebrate activity. The plan is to replicate the study over several years and gather more data.

## What are the next steps?

Moredun has named the group the Environmentally-Sustainable Livestock Farming (ELF) working group, reflecting a more focused mission to develop livestock farming practices that promote both environmental regeneration and improved animal health and welfare. To broaden participation and ensure diverse perspectives, invitations to join the group will be extended based on suggestions from current members. Additionally, the group will explore funding, which would provide further support for its initiatives. An online poll will be conducted to gather input and identify key priorities from working group members. This collaboration will be extremely helpful to advance research and inform evidence-based practices in regenerative farming.

We would love to hear from you about what regenerative practices, if any, you have tried on your farm, and what challenges or successes you have encountered. Your experiences will help guide the ELF group's direction, ensuring that our research and recommendations are grounded in the practical needs of the farming community.

# Further Information

[i] Farm Advisory Scotland. (2024, May 31). Management Matters. *Agribusiness News November 2021. Information helping farmers in Scotland | Farm Advisory Service*. p10. FAS. https://www.fas.scot/publication/agribusiness-news-november-2021/

[ii] SCOPS. 2024.Environmental Considerations. Sustainable Control of Parasite: SCOPS. https://www.scops.org.uk/internal-parasites/environmental-considerations/

[iii] Scottish Environment, Food and Agriculture Research Institutes. 2022. Anthelmintics and the Environment – opening a whole can of worms?. Scottish Environment, Food and Agriculture Research Institutes. https://sefari.scot/research/anthelmintics-and-the-environment-%E2%80%93-opening-a-whole-can-of-worms

**Further reading**

There are more news sheets available on our website (see list below). Members can access these by visiting www.moredun.org.uk/resources/factsheets and logging into the members area.

*Cryptosporidiosis in Cattle*

*An Update on Ovine Pulmonary Adenocarcinoma (OPA or Jaagsiekte)*

*Ticks and Tickborne Diseases*

*Treatment, Control & Prevention of the Main Causes of Foot Lameness in Sheep*

*Biosecurity for Key Livestock Diseases*

*Bovine Respiratory Disease Complex*

*Stop the Spread: Taking Control of Sheep Scab*

*Sustainable Roundworm Control in Cattle*

*Poultry Red Mite*

*Reducing Reliance on Wormers: Using Lamb Performance to Optomise Treatments*

*Joint-ill in Lambs*

*Fluke Risk and Conservation Grazing - a Guide to Good Practice*

*Moredun's Centenary Science Stories - Volumes 1-4*

*Equine Grass Sickness: a Research Update and look to the Future*

*Sustainable Parasite Control: Test, Don't Guess!*

*Control of Bovine Viral Diarrhoea (BVD)*

*Bovine Neosporosis*

*Control of Enzootic Abortion in Sheep*

*Control of Toxoplasma Abortion in Sheep*

*Malignant Catarrhal Fever (MCF)*

*Johne's Disease (Paratuberculosis)*

*Fighting Fluke in Sheep and Cattle*

*Mastitis Control in Dairy Cattle*

*Coccidiosis in Lambs - an Update*

*Nematodirus: a Changing Parasite*

*Sheep Scab*

*Health Planning for Beef Herds*

*Caseous Lymphadenitis (CLA) in Sheep*

*Mastitis in Sheep*

*Flock Health Planning*

*Tapeworm and Tapeworm Larvae that Infect Sheep*

*Common Disorders of Breeding Rams*

*Infectious Bovine Rhinotracheitis (IBR)*

*Orf Infection in Sheep*

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