

The Spark

SEFARI Gateway's Newsletter

Aug 2024



Scottish Government
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Welcome to the August 2024 edition of The Spark, your monthly update from [SEFARI Gateway](#) (Centre of Expertise for Knowledge Exchange & Innovation) on the latest research developments from the [Scottish Government's Environment, Natural Resources and Agriculture \(ENRA\)](#) strategic research programme. The ENRA Research Portfolio provides evidence for policy and practice across environment, climate change, biodiversity, land use, agriculture, food, and rural community agendas.

Scotland is playing a central role in developing environmental solutions to the global climate and nature crises, and the Scottish Government response is based on the strongest possible scientific evidence. The Environment, Natural Resources and Agriculture research programme is key to achieving this.



We'd love to hear from you and receive your feedback on how we can improve our newsletter. Please contact us at info@sefari.scot with your suggestions.

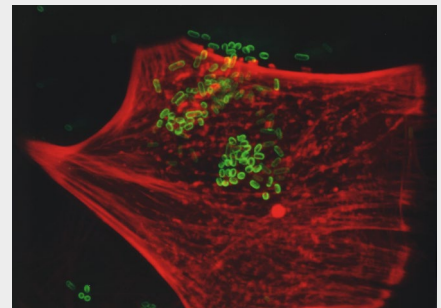
Work on faster and better tools to tackle *E. coli* threat in spotlight after latest food scare

E. coli (STEC) hit the headlines in June this year with reports of 275 cases of O145 in the UK, 58 of which were in Scotland. ENRA-funded studies by SEFARI scientists are looking at other elements as part of the bigger STEC story. With the headlines generating more interest, the SEFARI scientists have been getting the word out there about the SRP research. Here, Sue Tongue from SRUC tells The Spark about the team's research and their work with Food Standards Scotland and the NHS Scottish *E. coli* O157 Reference Laboratory (SERL).

Escherichia coli bacteria occur normally in the gut of animals and humans. Most are harmless. However, some *E. coli* produce Shiga toxins that can cause human disease. The main source of Shiga toxin-producing *E. coli* (STEC) are ruminants (e.g. cattle, deer), which shed bacteria in their faeces without showing signs of disease. Humans are often infected by eating contaminated food. STEC can also be spread by close contact with an infected person, direct contact with an infected animal, or its environment.

[SEFARI scientists are investigating the diversity of STEC bacteria](#) in different Scottish animal populations. The research focuses on the use of genome sequence data to explore how these populations of animals and bacteria interact and to identify novel diagnostic tools.

Molecular markers from genes of a lettuce-derived STEC [have been identified](#) that could improve rapid identification of fresh produce-associated STEC. We've learnt that STEC occur at low levels in sheep and more frequently in farmed deer than wild deer. Sequence data show that for a specific type of STEC, namely O157:H7, some strains from [farmed deer and some strains from sheep](#) are very similar, or identical, to some of those previously isolated from Scottish human cases.



This research has contributed information to Food Standards Scotland (FSS) and Public Health Scotland's Incident Management Team, increased the breadth and depth of the NHS Scottish *E. coli* O157 Reference Laboratory's database of Scottish STEC genome sequences, and addresses FSS's Strategy for 2021-2026 to identify the main risks to consumers from foodborne illness and food safety.

Food
Standards
Scotland

Public Health
Scotland

Ag of the middle in the North Highlands of Scotland



Medium sized farms, or 'ag in the middle' often go under the radar and can face a number challenges yet they make a significant contribution to Scotland's economy and natural capital in a wide range of ways, not least through regenerative agriculture, localised food production and tourism.

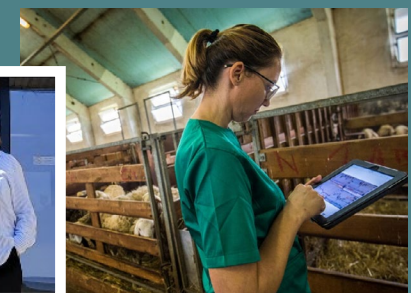
SEFARI Gateway supported a Fellowship to see what can be done, first to quantify this important contributor and then to support this sector. A robust selection of farming industry partners contributed to the report by the SEFARI scientists. The Food, Farming & Countryside Commission (FFCC), North Highland Initiative (NHI), the Scottish Crofting Federation (SCF) and Scottish Agricultural Organisation Society (SAOS) all contributed to the 'Ag of the middle' in the North Highlands of Scotland.

This [report](#) evaluated the ways that crofts and small to medium sized farms and their markets can become more resilient through playing to their strengths – increasing their food outputs, increasing the quality of their produce to de-commoditize their output, economies of scope & scale and routes to local and regional markets. Identifying beef production systems via census data proved inaccurate, highlighting the additional value that ScotEID animal tracking data would provide and the way it would help inform the agricultural payment support framework that delivers for Ag of the Middle farms.

A follow-on workshop will address regional opportunities and challenges, better identification of semi-natural habitats within farms, and refining the transport network to account for delays and travel costs. The report outlines several example case studies (e.g. from farms in Caithness and Shetland) which will be published as separate reports.

Please email lorna.dawson@hutton.ac.uk if you would like to attend the workshop.

Photo above by Dietmar Reichle on [Unsplash](#)



Improving Biosecurity on farms

Scientists involved in a RESAS-funded push to increase the uptake of biosecurity measures by improving communications with farmers have been promoting the work with European partners. Dr Maria Costa and Dr Kate Lamont from SRUC are part of the team undertaking the SRP project on the use of "farmer-centric" models to boost livestock health.

They both recently travelled to the Estonian University of Life Sciences in Tartu to collaborate with colleagues from across Europe as part of the **BETTER COST Action project – run by the COST** (European Cooperation in Science and Technology) funding agency – which seeks to better understand the motivators and barriers for biosecurity implementation.

Biosecurity is of paramount importance to prevent the introduction and spread of pathogens and, consequently, to preserve the health of farmed animals. Healthier animals result in better animal welfare, better sustainability of animal production systems and less antimicrobial use. But measures in place at present are not as strong as they could be due to issues such as a lack of knowledge of how to improve, staff shortages, communication inadequacies and the multiplicity of methods used to assess and measure implementation and cost-effectiveness.

Dr Costa leads a work package for the project on scaling-up the knowledge and experience of stakeholders and the general public and Dr Lamont gave a presentation about how to communicate effectively with farmers about biosecurity.