



Teagasc Signpost Series

15th October 2021

Gavin Hunt

A World
Leading SFI
Research
Centre

Science
Foundation
Ireland **sfi**
For what's next



Irish dairy Farmers are suffering from Environmental and Market Pressures



Aim of the FZC Project

Farm Zero C is a collaboration between BiOrbic, Carbery and others to create an economically viable, climate neutral dairy farm

The project presents a holistic approach to reduce greenhouse gas emissions and increase the health and resilience of the farm

Farm Zero C will be a beacon for sustainable agriculture and provide a bright future for farmers and rural communities

Our Partnerships



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin



MTU
Ollscoil Teicneolaíochta na Mumhan
Munster Technological University



About Shinagh Dairy Farm

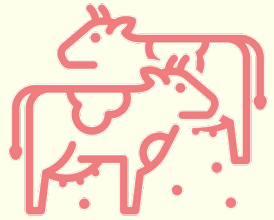
- Shinagh Farm is a working dairy farm, milking 250 crossbred Holstein Friesian/Jersey cows on 250 acres
- Set up in 2011 as part of a joint programme between Teagasc and Carbery and is owned by the four West Cork Co-ops
- Aim of this joint programme is to demonstrate the design, set up and operation of a large scale dairy unit on a grass based system and to provide information on the profitability and sustainability of this type of farming system
- The focus of Shinagh Farm has now pivoted as part of the Farm Zero C project



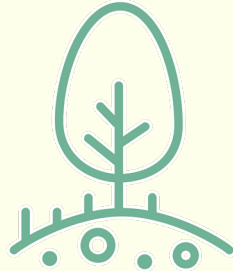
	2020
Stocking rate (LU/ha)	2.57
Grass grown (T DM/ha)	13.23
Grass Utilised (T DM/ha)	10.9
Six-week calving rate (%)	91
Empty rate (%)	9.2
Mean calving date	19-Feb
Milk solids production (kg/ha)	1,113

Table 1. Performance of Shinagh Farm

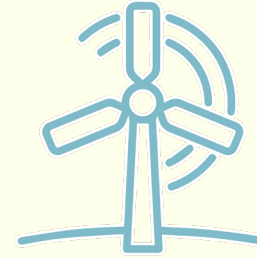
About the Project – Our Pillars



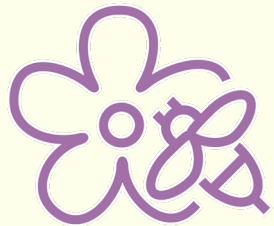
Animal Diet
& Breeding



Soil & Soil
Carbon



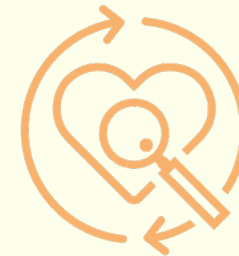
Renewable
Energy



Biodiversity

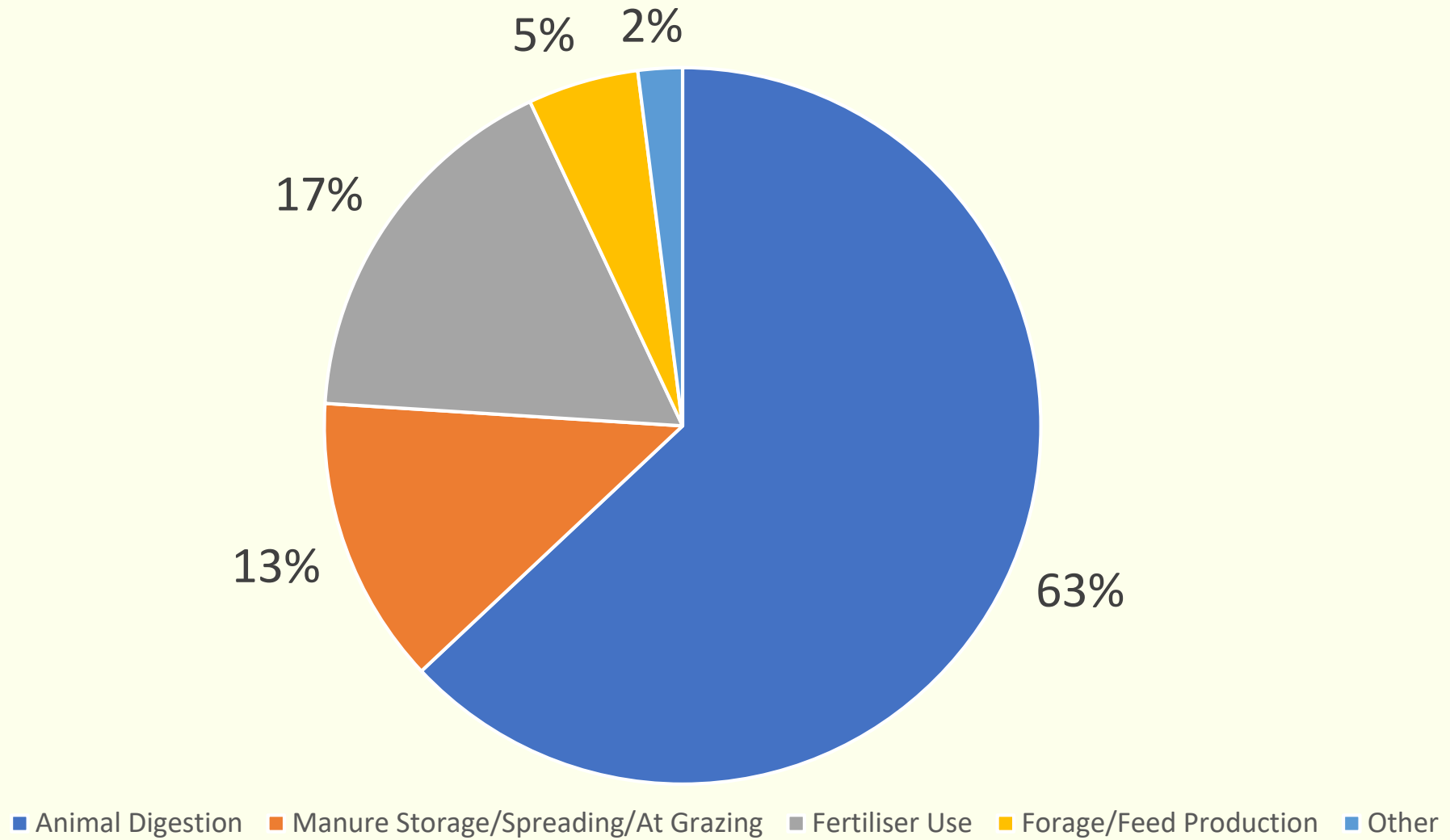


Clover & Multi
Species Swards

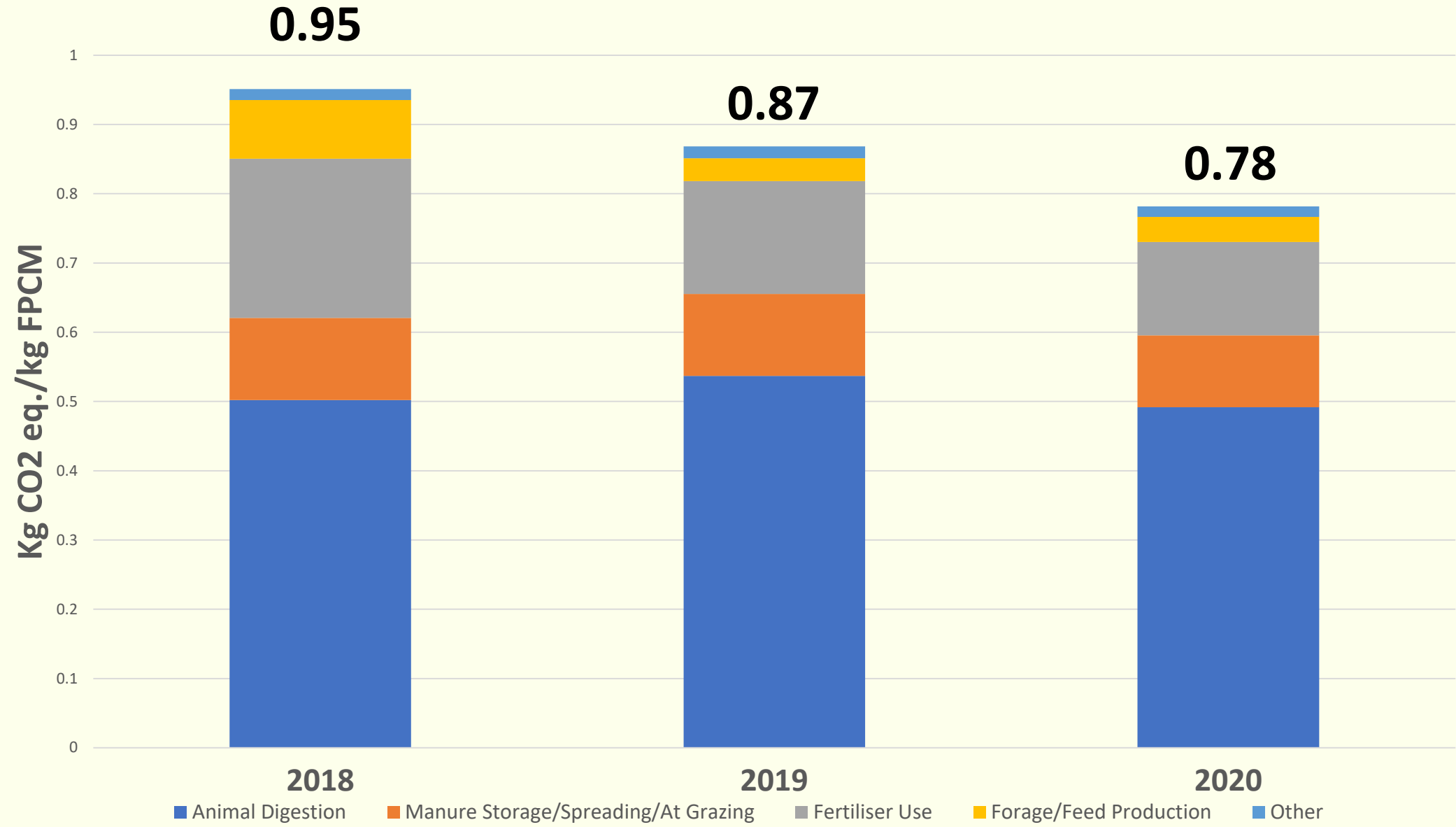


Life Cycle
Analysis

Carbon Footprint



LCA Analysis



GHG Mitigation Measures Implemented on Shinagh Farm



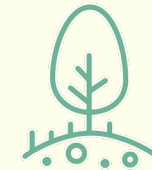
We are incorporating clover into swards to reduce our chemical nitrogen (N) usage. The aim is to reduce chemical N to an average of **150 kg/ha**.



We are using protected urea since **2020** to reduce GHG emissions. Protected urea has **71%** lower nitrous oxide emissions compared to Calcium Ammonium Nitrate (CAN)



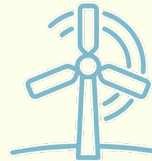
We are using low emission slurry spreading (LESS) equipment on the farm since **2020**. LESS increases the N fertiliser value of the slurry allowing us to reduce the total chemical N input and also reduces ammonia emissions by up to **30%**.



Grassland management is excellent on the farm with an average of **14 T DM/Ha** grown over the last few years. The target is to enter covers of **1300/1400 kg DM/Ha** over the main grazing season and achieve 280 days at grass.

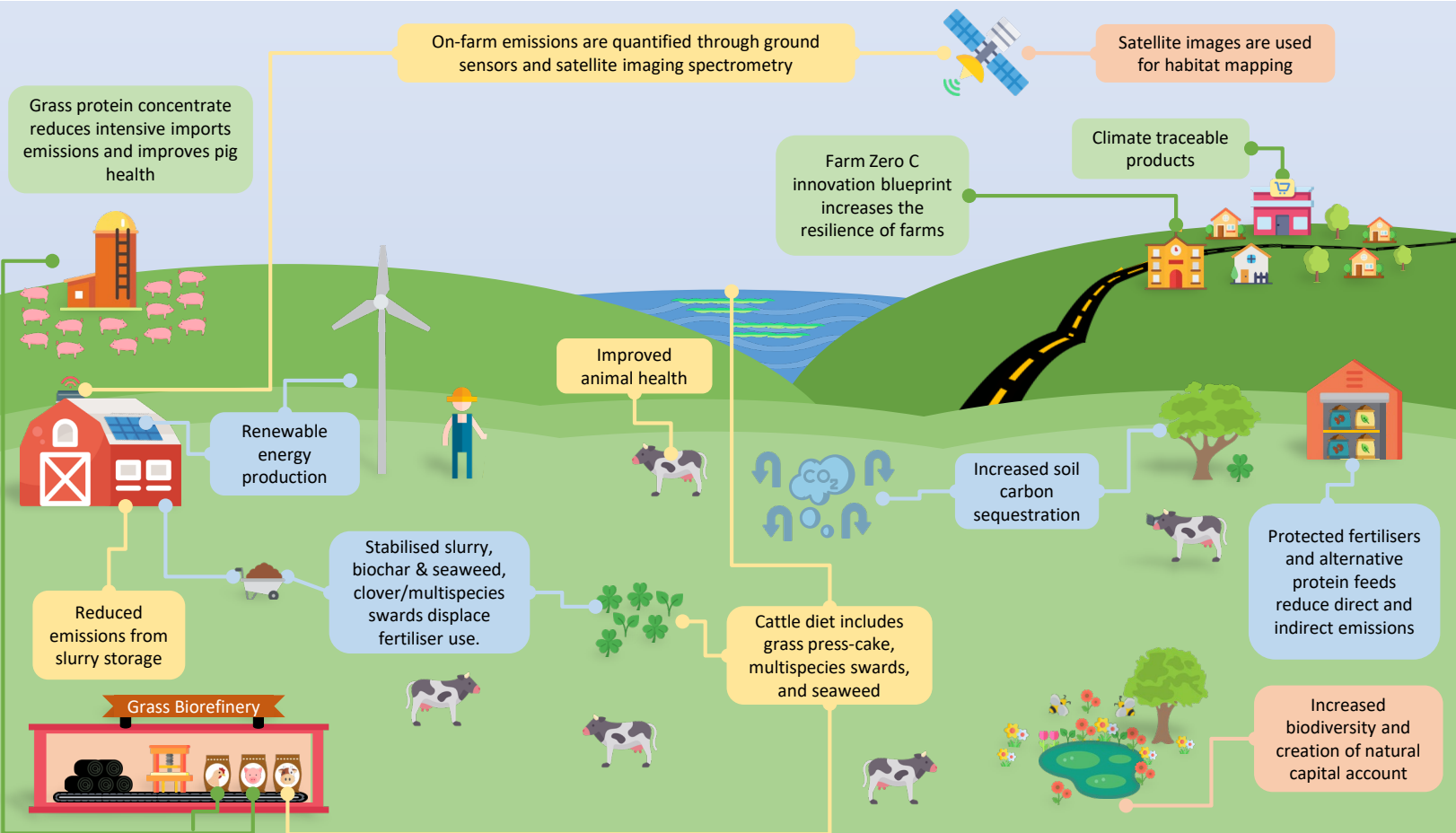


We are using the Economic Breeding Index (EBI) to improve milk solid production, fertility and health, to maximise profitability and environmental sustainability. The EBI of the Shinagh herd is in the top **5%** nationally.

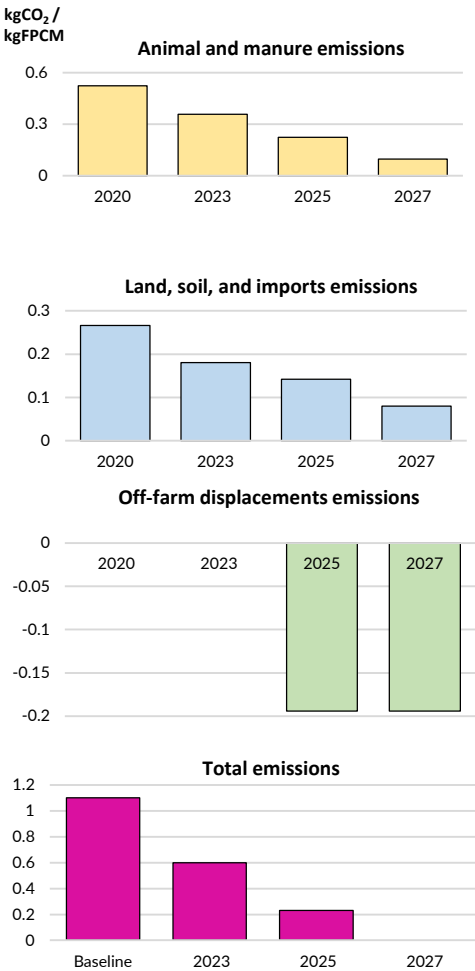


A wind turbine was installed at Shinagh in **2011**, it supplies approximately **30%** of the farm's energy requirements

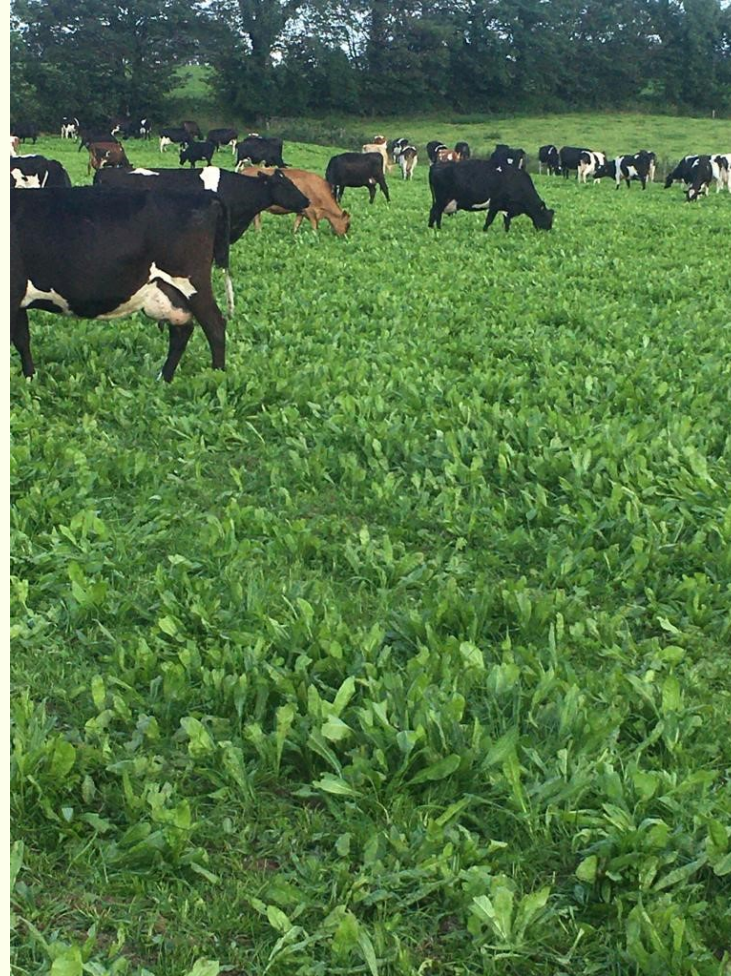
Our holistic approach



- Animal and manure emissions
- Land, soil, and imports emissions
- Off-farm social and technological impact
- Biodiversity strategies



Multi species grazing



Monitoring and verifying soil C sequestration will take us further to prove **Negative Emissions** on the farm

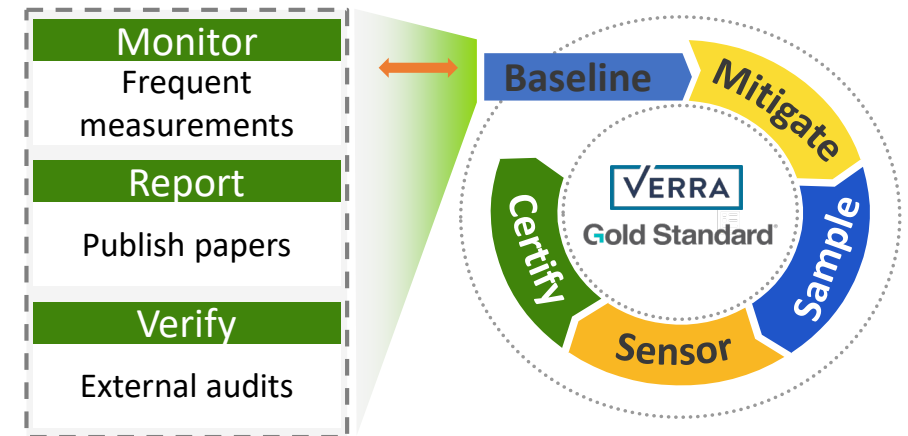
C sequestration is not part of IPCC framework

Verifying the amount of carbon sequestered in farm soil



How will we measure sequestration?

- Analyse satellite data from Shinagh
- Monitor soil carbon stocks through soil sampling
- Quantify real-time greenhouse gas fluxes and meteorological variables using a C-flux tower



Farm Zero C **negative emissions** strategy will promote organic practices to increase the C-Seq rate

Conclusion – Farm Zero C Delivering Impact



Placing the farm at the centre of the solution



We have built the solution foundation that can be rolled out rapidly to farmers



Transform agriculture in Ireland and provide a bright future for farmers and rural communities



Help Ireland to meet and exceed EU targets (2030/2050)



Farm Zero C will be a beacon for sustainable agriculture globally