KERRY

Evolve

Dairy Sustainability Programme

Consumer Requirements

People are becoming more aware of the nutritional and environmental impact of their purchasing choices.

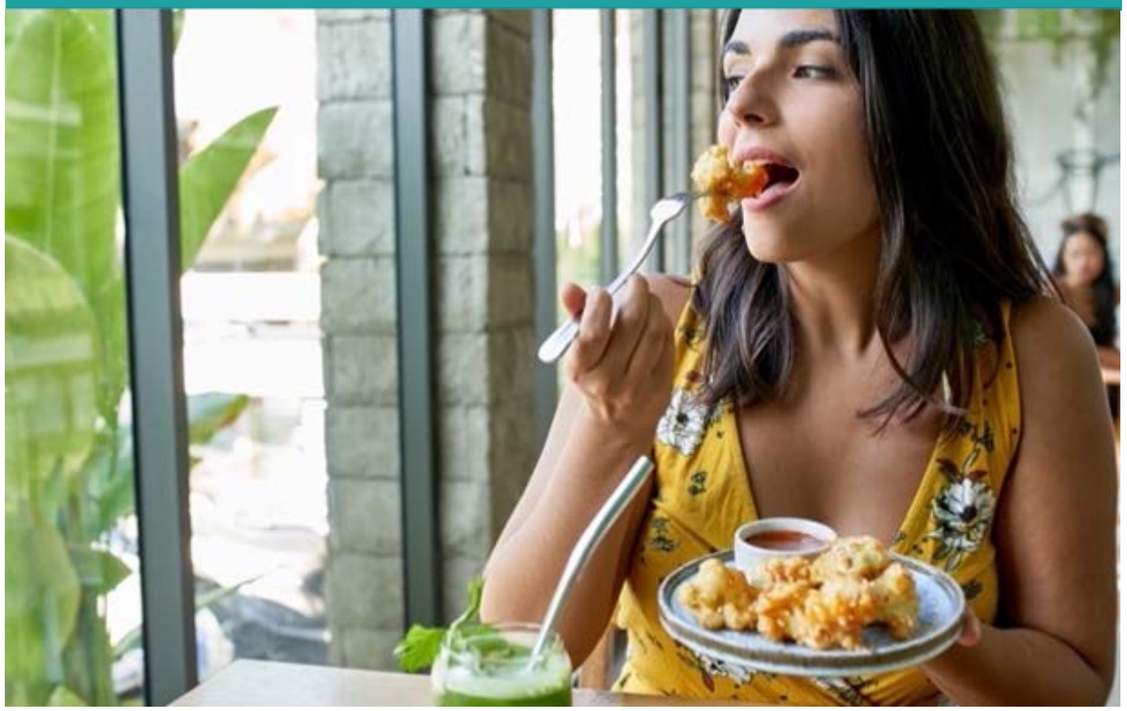
Beyond the Horizon

Kerry will reach over 2 billion people with sustainable nutrition solutions by 2030.

Evolve

Accelerating the adoption of sustainable farming practices.

Sustainability is top-of-mind for consumers around the globe, **73%** of consumers say they would change their behaviour to reduce negative impact on the planet.



Source: Proprietary Consumer Research – Sustainability 2021.

Introduction

Kerry has a long and proud history of working with our family farms in the adoption of best practice with regard to quality milk production, financial management, breeding, soil fertility and grassland management.

Feeding a growing population while maintaining human health within a healthy ecosystem presents a huge challenge for our industry. The global environmental impact from agriculture is under increasing scrutiny. Agricultural development plays an essential environmental, social and economic role which is vital for food security. As part of Kerry's vision for the next decade, we see the possibility for a world of sustainable nutrition, one that contributes to good health while protecting people and the planet.

Already one of the most carbon efficient dairy producers in the world, Kerry is committed to building on past achievements and continuing to provide leadership in making a positive contribution to our future climate objectives whilst ensuring the environmental, social and economic sustainability of our family farms.

Our sustainability strategy, Beyond the Horizon, supports Kerry's ambition to reach over two billion people with sustainable nutrition solutions by 2030. We are committed to working with our milk suppliers to deliver on national and business sustainability commitments into the future.

What is Evolve

Evolve is our dairy sustainability programme. It is a new concept designed to support the accelerated adoption of science-based sustainable action and best practice across our family farms.

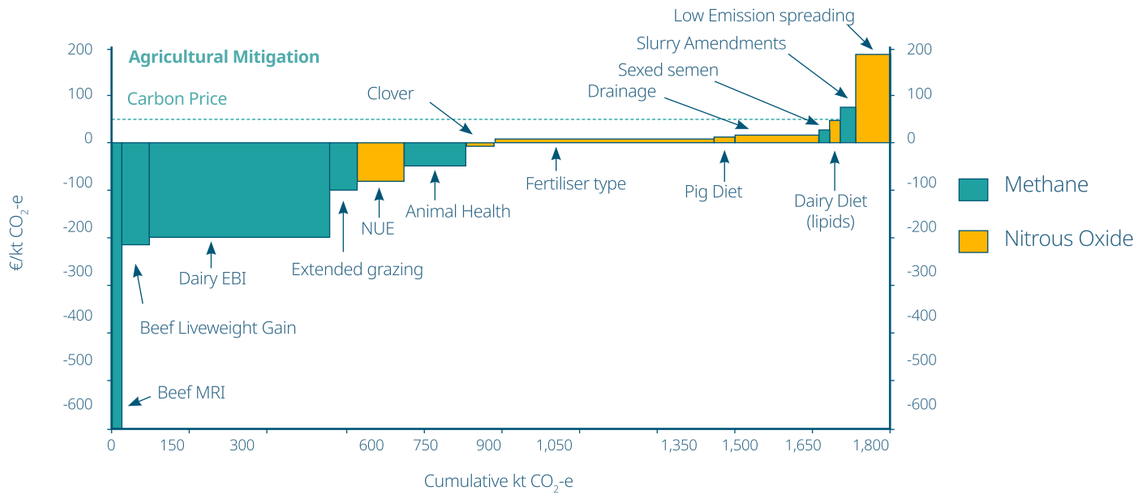
Kerry will lead the transition to and acceleration of more sustainable farming practices by providing targeted financial support to build on existing achievements and grow the knowledge of and engagement with sustainable farming practices.

The Evolve programme is holistic in nature with a broad focus on carbon reduction, ammonia reduction, water quality and biodiversity.

The programme is also underpinned by the Teagasc Marginal Abatement Cost Curve (MACC), which sets out proven, science-based actions that farmers can take to reduce on-farm carbon emissions.

Evolve is designed to enable annual re-evaluation and updating of actions in line with legislative changes and scientific developments.

The Teagasc marginal abatement cost curve (MACC)



What is Carbon Footprint

Carbon footprint is an expression of the total greenhouse gas (GHG) emissions caused by an organization, event, product or person.

A GHG is any gas in the atmosphere which absorbs and re-emits heat, and thereby keeps the planet's atmosphere warmer than it otherwise would be. The predominant GHGs associated with dairy farming are methane, nitrous oxide and carbon dioxide.

When the carbon footprint for your farm is calculated, the GHG emissions associated with your farming activities are converted to carbon dioxide equivalents (CO_2 eq.) based on their Global Warming Potential (GWP) over a period of 100 years.

CO_2 eq. usually simply stated as Carbon, is a useful means of describing different GHGs in a common unit when calculating the total carbon emissions from your farming enterprise.
The total carbon emissions from your farm are ordinarily expressed over your farms total product output to give a carbon footprint figure per unit of output. In dairy farming, the unit of output used is the Kg of Butterfat and Protein Corrected Milk (FPCM).

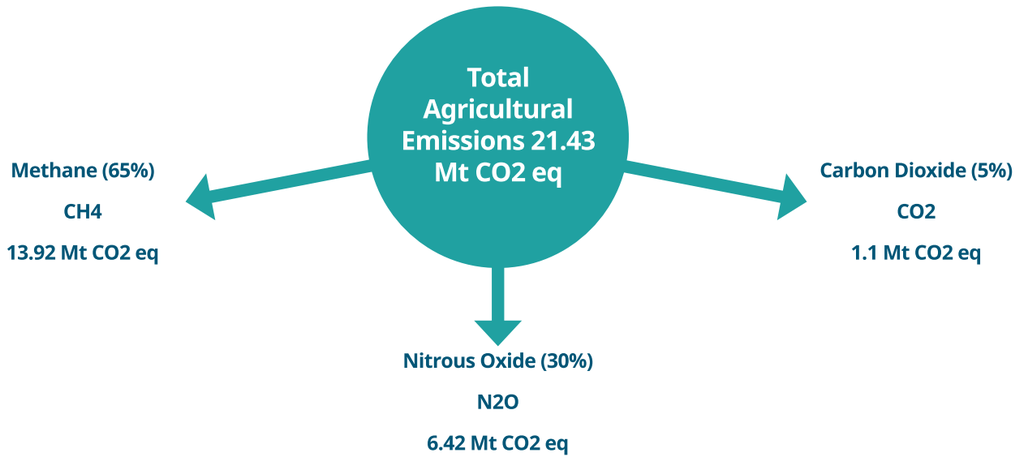
Carbon emissions in Irish agriculture

The agri-food sector is an incredibly valuable part of the Irish economy, and is a key contributor to economic growth. We are a food-island and the lack of large scale heavy industry places agriculture front and centre in Ireland's efforts around climate change and environmental protection.

Carbon emissions from agriculture make up a large share of Ireland's total carbon emissions at 37.1% or 21.43 million tonnes of CO_2 eq. (source EPA).

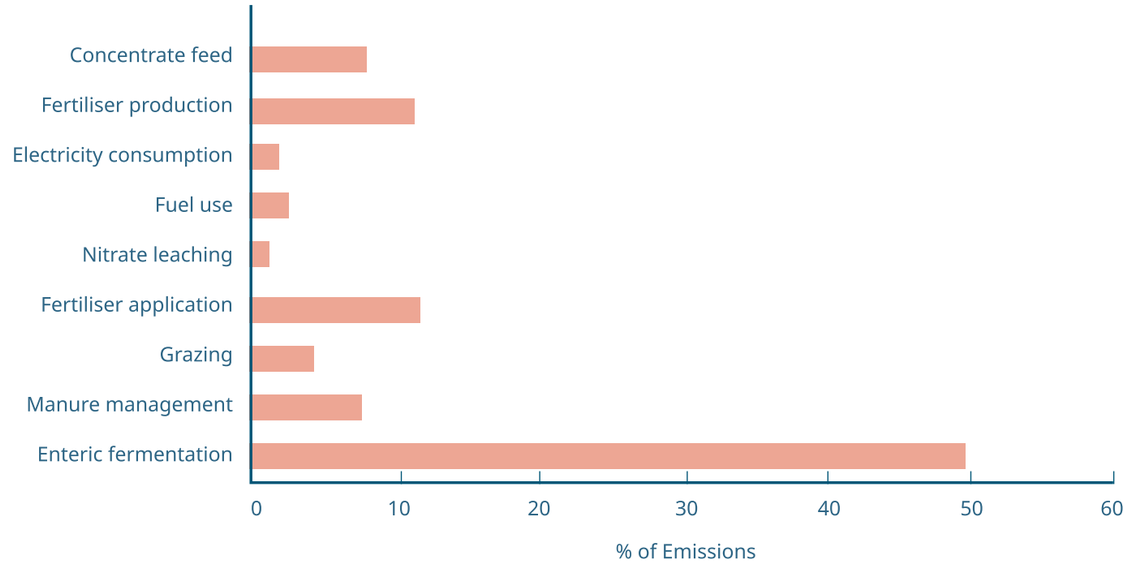
The majority of agricultural emissions come from methane (65% of total emissions). Enteric fermentation (digestion) is responsible for the vast majority of methane emissions (50% of total emissions). Nitrous oxide stemming from the spreading of artificial fertiliser and slurry on land is the second most predominant gas (30% of total emissions). The remaining 5% of total emissions is derived from carbon dioxide from sources such as energy use and fossil fuel combustion.

Irish Agricultural Emissions (2021)



Source: Environmental Protection Agency (EPA)

Carbon emission sources in Irish dairy



Future of Dairy

Consumers globally have a growing desire to consume food produced in a more sustainable way. As customer sentiment in this area grows and develops, the emphasis on and delivery of sustainable dairy must keep pace or we as an industry risk losing market share, market access and potentially our social license in the long-term. We must take action now to build upon our status as one of the most sustainable dairy systems in the world to ensure we pass on our farms, our countryside and our environment to younger generations in progressively healthier status.

Kerry is committed to working with our milk suppliers in achieving this goal and in meeting global and national bio-diversity, water-quality and emission targets.

National Emission Reduction Targets

Climate Action and Low Carbon Development (Amendment) Act 2021 requires:

A reduction of 51% in national emissions by 2030 as we transition to a climate resilient, biodiversity rich and climate neutral economy by 2050.

Agricultural Emission Reduction Targets

2021 Climate Action Plan requires:

A reduction of 22-30% in agricultural emissions from a base of 23 Mt CO2 eq to reach 16-18 Mt CO_2 eq. by 2030.

How will this be achieved

Climate Change Advisory Council Sectoral Carbon Budgets

The agriculture sectoral budget provides for a 4.8% annual percentage reduction in GHG emissions in the period 2021-2025, an annual percentage reduction of 8.3% in the period 2026-2030 and an annual percentage reduction of 3.5% in the period 2031-2035.

How the adoption of science-based actions will help reduce your farm's environmental footprint

Use of Protected Urea

Protected urea is a urea nitrogen (N) fertiliser made safe from ammonia loss through the addition of a urease inhibitor. There are a range of protected urea products on the Irish market with the nitrogen content ranging from 29% to 46%.

How it works

Slows the rate at which urea is converted to ammonium, reducing nitrous oxide and ammonia losses.

Benefit to the environment

- ✓ Protected urea is the only fertiliser type that reduces both nitrous oxide and ammonia emissions.
- ✓ Protected urea has 71% lower nitrous oxide emissions than CAN and reduces ammonia losses by 79%, compared to ordinary urea.

Benefit to the farmer

- ✓ Per kilogram of N utilised, protected urea is more cost effective than calcium ammonium nitrate (CAN) and standard urea.

Actions needed by dairy farmers

- Replace all straight N with protected urea across the fertiliser season.

Grazing Management

Grass is by far the cheapest source of nutrition for the ruminant animal and has excellent nutritional quality. With Ireland having a climate to grow grass in abundance, its utilisation must be maximised. Rotational grazing practices are effectively used on dairy farms across Ireland and provide many benefits to the farmer as well as the environment. The use of new technologies have further enhanced grassland management practices and their uptake can prove instrumental in decision making across the farm.

How it works

Animals grazing better quality grass produce less methane and have higher milk yields. Better control of grass supply will help reduce chemical fertiliser and concentrate requirements.

Benefit to the environment

- ✓ Better feed quality improves feed efficiency and lowers methane production.

Benefit to the farmer

- ✓ Every extra tonne of grass dry matter (DM) grown and utilised is worth €173/tonne.

Actions needed by dairy farmers

- Walk your farm weekly and use Pasture Base to support decision making.
- Manage pre-grazing covers in mid-season.
- Improve grazing infrastructure and use on/off grazing when soil conditions are poor.
- Implement a good reseeding policy.

Extended Grazing

Extended grazing refers to maximising the herds days at grass at either end of the grazing season.

How it works

This involves the provision of good grazing infrastructure including spur roadways and multiple access points to allow animals to graze at the shoulders of the grazing season.

During very wet weather it involves the use of on/off grazing and selection of paddocks which have greater shelter, are generally drier and have several access points to avoid poaching.

Benefit to the environment

- ✓ Every additional week at grass reduces total carbon emissions by 1%.
- ✓ Less slurry stored and less silage in the diet.

Benefit to the farmer

- ✓ Every extra days grazing is worth €2.70/cow/day in spring and €1.80/cow/day in autumn.
- ✓ Less silage in the diet reduces methane emissions.
- ✓ Less slurry management required.
- ✓ Improved animal performance.

Actions needed by dairy farmers

- Use autumn and spring rotation planners to optimize grazing.
- Develop a good roadway network throughout the farm.
- Use on/off grazing.
- Use drier paddocks on your farm at the shoulders of the season.

Incorporating Clover

Reseeding or carrying out sward renovation, also referred to as 'stitching in', to include clover within swards. There are a wide variety of seed mixtures now available with clover including our Top Sward range.

How it works

Clover has small nodules (lumps) on its roots which contain bacteria that have a symbiotic relationship with the grass plant. These bacteria fix the nitrogen that is in the air and convert it into nitrate in the soil.

Benefit to the environment

- ✓ Nitrous oxide emission reduction is achieved through lower fertiliser requirements (up to 100kg N/ha saved) - achieving up to 40% reduction in nitrous oxide emissions.

Benefit to the farmer

- ✓ Increased milk solids of up to +30 kg/cow/year.
- ✓ Increase farm profit by €150/ha.

Actions needed by dairy farmers

- Target 100% of your paddocks with clover incorporated (increase sward clover content to 20%) over 5 years.

Health & Welfare

Good animal health and welfare allows animals to reach their full genetic potential, maximising productivity. The Farm Animal Welfare Advisory Council (FAWAC) guidelines clearly set out the five freedoms of animal welfare and further recognise that it is impossible to realise the genetic capability of animals if they are facing a deteriorating health status.

How it works

Enhanced animal health and welfare increases animal performance, reduces replacement rate, reduces the number of non-milking animals on-farm and reduces mortality.

Benefit to the environment

- ✓ Improvements in health will reduce carbon emissions per unit of output.
- ✓ Increased output per cow for the same level of inputs.
- ✓ Less cows to produce a similar output.

Benefit to the farmer

- ✓ Reduced veterinary costs.
- ✓ Reduced animal mortality.
- ✓ Improved labour efficiency.
- ✓ Improved overall farm profitability.

Actions needed by dairy farmers

- Implement a full herd health & welfare programme on-farm.
- Participate in the Munster Bovine Herd Health Programme.
- Use the EBI sub-index for health.
- Implement a targeted vaccination programme.
- Implement good stock importing and biosecurity measures.
- Maintain a closed herd, if possible.

Improving Genetic Merit (EBI) of the Dairy Herd

Economic Breeding Index (EBI) is a single figure profit index aimed at helping farmers identify the most profitable bulls and cows for breeding dairy herd replacements.

How it works

Careful high EBI sire selection paired with the use of the highest EBI cows in the herd will produce calves with the highest genetic merit on the farm. Although this method requires a long implementation time, the benefits are permanent and cumulative. Sexed semen will accelerate the process of boosting the herds EBI and also allow for the use of more high Dairy Beef Index sires.

Benefit to the environment

- ✓ Higher EBI cows have a lower carbon footprint due to better fertility, improved herd lifetime milk performance and improved efficiency relative to lower EBI cows.
- ✓ For every +€10 increase in EBI, carbon emissions decline by 1% per unit of output.

Benefit to the farmer

- ✓ Every +€10 change in herd EBI has the potential to increase profit by €20/cow.

Actions needed by dairy farmers

- Increase the EBI of your herd by €10 per year.
- Milk Recording and use of AI is essential in the journey to increase the genetic merit of your herd.
- Use sexed semen to breed replacements.

Low Emission Slurry Spreading (LESS)

Cattle slurry is a valuable source of nitrogen (N), phosphorus (P) and potassium (K) produced on farm. The N in cattle slurry is in the ammonia form similar to N in urea fertilisers and so, can be easily lost to the atmosphere. LESS application techniques such as dribble bar or trailing shoe reduce the surface area of the slurry compared to the splash plate thus reducing the loss of N as ammonia to the air.

How it works

Reduced volatilisation increases the N fertiliser value of slurry thereby reducing the total chemical N inputs required.

Benefit to the environment

- ✓ Reduces ammonia emissions from slurry by up to 30% and nitrous oxide emissions through reduced chemical N.

Benefit to the farmer

- ✓ Retains an extra 3 units of N/1,000 gallons of cattle slurry - worth €3.30/cow.
- ✓ Slurry can be applied to paddocks with higher grass covers using LESS and paddocks can be grazed sooner.

Actions needed by dairy farmers

- Switch to LESS equipment for all slurry spreading.

Nutrient Management Planning

This involves soil sampling paddocks and deriving a nutrient application strategy based on the soil pH, P and K index.

How it works

Correct soil fertility will maximise the efficiency at which nitrogen fertiliser is utilised, thereby allowing similar grass production with reduced N or increased grass production at the same N input. Correct soil pH also improves the availability of nutrients to the plants.

Benefit to the environment

- ✓ Reduces nitrous oxide emissions and nitrate losses to water.

Benefit to the farmer

- ✓ Every €1 invested in lime is worth €4 to €7 in extra grass.
- ✓ Increased grass dry matter production – 2t DM/ ha more with optimum versus poor soil P.
- ✓ N recovery by grass plant is doubled with optimum versus poor soil fertility.
- ✓ Target slurry to paddocks based on actual nutrient value.

Actions needed by dairy farmers

- Soil sample your farm and develop a Nutrient Management Plan.
- Use colour coded maps to aid fertiliser spreading decision making and correct deficiencies in pH, P and K.
- Target slurry application on low P and K soils.
- Take a slurry sample for nutrient analysis.

Agricultural Sustainability Support & Advisory Programme (ASSAP) - Water Quality

This is a national approach to improve water quality in rivers and streams through working with the farming community. ASSAP provides practical tips for farmers to implement which will benefit the streams, rivers and other water bodies across our catchment.

How it works

The Environmental Protection Agency has identified priority catchments or 'areas for action' across the country where the status of the water is at risk of falling from a range of both agrricultural and non-agricultural pressures.

Where an agricultural pressure is identified the farmers in the area will receive the offer of a free farm visit from an ASSAP advisor. The purpose of the visit is to meet with the farmer and assess the farm for any potential issues that may be having an effect on the water quality in the local catchment.

The advisor will then provide practical advice to the farmer which is designed to 'break the pathway' and prevent nutrients from entering water.

Benefit to the environment

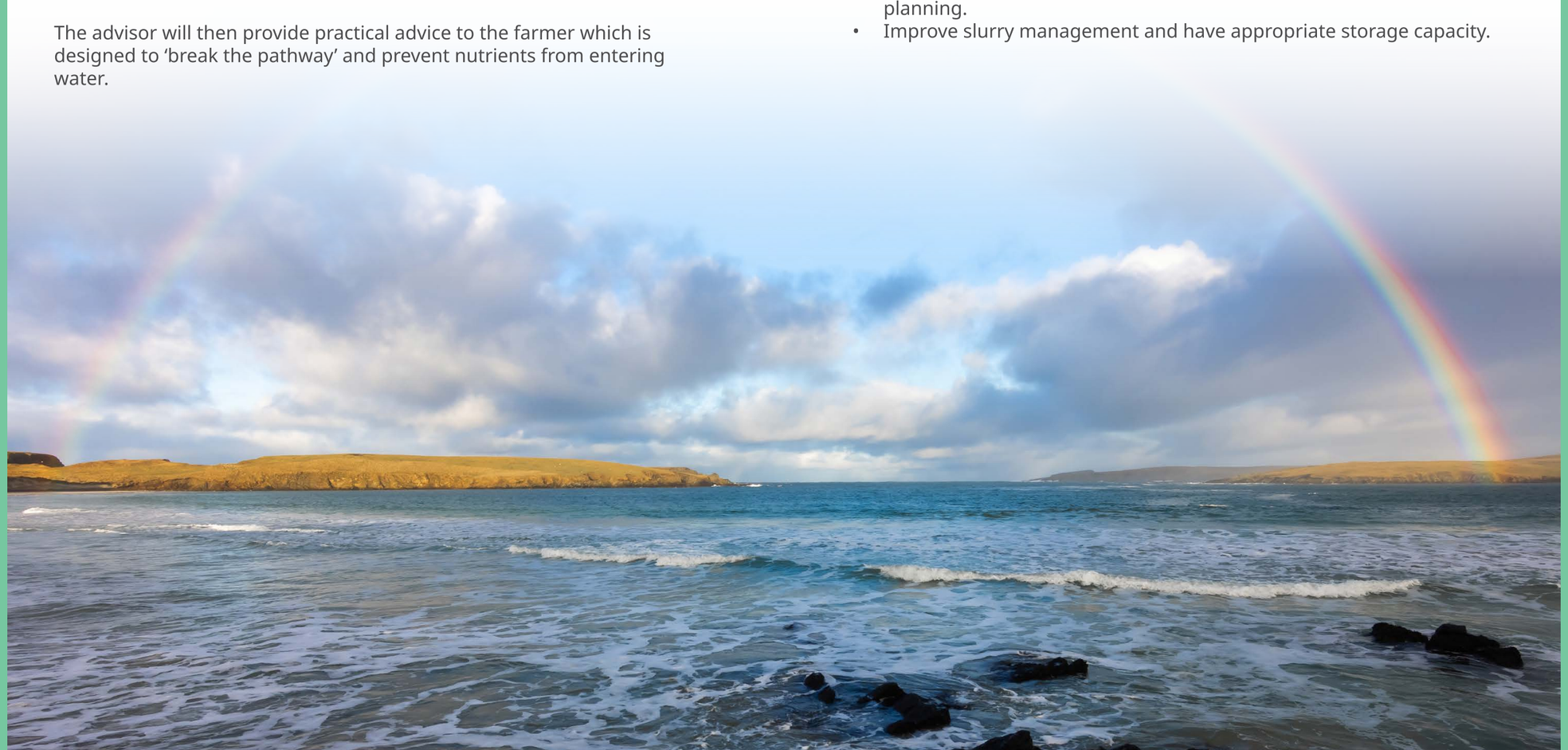
- ✓ Reduced eutrophication.
- ✓ Reduced nutrient load to rivers and streams.
- ✓ Improved ecosystems so plants, animals, fish and insects that depend on having healthy water can thrive and flourish.

Benefit to the farmer

- ✓ Education on local water quality.
- ✓ Practical advice on water quality pressures.
- ✓ Identifying critical source areas on farm.
- ✓ Reduced fertiliser cost by precision application of slurry & fertiliser.

Actions needed by dairy farmers

- Engage with your Kerry Agribusiness ASSAP advisor.
- Undertake agreed actions.
- Attend stream side farmer information meeting in local catchment.
- Precision nutrient application through better nutrient management planning.
- Improve slurry management and have appropriate storage capacity.



Biodiversity

Biodiversity, also referred to as biological diversity, is the range of life that exists in any given area. Biodiversity loss is a national challenge with half of our native bee species in decline over the past 30 years with some mammals also in decline. As Agriculture is the largest land use in Ireland, farmers can play a huge part to reverse this trend.

Biodiversity depends on good farmland habitats which can be created or enhanced on every farm so local flora and fauna can flourish.

How it works

Ireland is one of the least forested countries in Europe and so, the planting of native trees on farmland can provide much needed tree cover for nesting birds and insects. Hardwood trees can be planted in corners of fields, along laneways or near watercourses.

Benefit to the environment

- ✓ Trees will vastly improve the biodiversity of the area.
- ✓ Native tree planting will provide shelter, food and habitats for wildlife.
- ✓ Trees play a key role in the carbon cycle and regulation of the air we breathe.
- ✓ Ability to sequester carbon, with hedgerow trees and shrubs like hawthorn being able to sequester up to 1 ton of carbon/ha/year.
- ✓ Deep rooted trees absorb rainwater and excess nutrients from the soil, especially from slurry and artificial fertiliser. This can reduce nutrient losses to water.

Benefit to the farmer

- ✓ Planting trees can help to reduce the loss of topsoil by water and wind erosion.
- ✓ Trees absorb valuable nutrients from deep in the soil and return them to the surface of the field through falling leaves, improving soil quality and organic matter.
- ✓ Trees planted can provide an alternative income stream from their timber and material value.
- ✓ Can be used as a diversification project to increase farm income.
- ✓ Area of shelter and shade for grazing animals.
- ✓ Trees on agricultural land provide food and habitats for many plants, insects and other animals that would not inhabit grassland or arable areas otherwise. This greater diversity increases the resilience to climatic changes such as flooding that farmers face.

Actions needed by dairy farmers

- Identify an areas of the farm to plant some trees.
- Enhance the habitat in existing hedgerows.
- Avoid excessive hedge cutting.
- Minimise fertiliser and pesticide usage in wildflower areas of the farm.

Evolve - 2022 Incentivisation Areas

Through this initiative we are incentivising our milk suppliers to work towards a significant and accelerated reduction in emissions by 2030. This programme will focus on implementing existing low carbon technologies at farm level and rewarding farmers for the uptake of these measures.

	Action	Detail	Evolve Incentive*
Biodiversity	Planting of native Irish trees and shrubs	Kerry will partner with Trees on the Land to fund a biodiversity programme across our catchment	200,000 trees by 2025
Soil & Fertiliser Management	Nutrient Management Plans	Colour coded maps presented annually and updated every 3 years	€100/Farm NMP
	Lime	Purchase lime via an approved supplier up to a maximum of 1 tonne/cow	€5/tonne
	Protected Urea	Purchase of proctected urea via Kerry Agribusiness	€40/tonne
	Slurry Analysis	Slurry analysed via approved laboratory	€20/sample
Production Efficiency	Milk Recording	Participation in Munster Bovine Milk Recording (min 4 tests)	€3/cow
	Breeding Consultation	Attend approved breeding consultation	€50/consultation/year
	Low Protein Feed	Purchase feed from Bloom Feeds low protein range	€10/tonne
Herd Health	Herd Health Culture & Sensitivity	Participation in approved Munster Bovine Herd Health Programme Engage in Culture and Sensitivity Testing	€100/herd €5/sample
Grass Management	Grass Measurement	Greater than 5 covers on Pasture Base Ireland (May to June)	€100/herd
Energy Use Efficiency	Low Emission Water Heating	Purchase of approved gas water heater	€100/unit
Knowledge Transfer	Approved Development Event	Participation in approved sustainability related event (Biodiversity, Financial, Grassland, People Management, Health & Safety)	€50/approved event

*Terms and Conditions apply - further detail to follow.

Beyond the Horizon

Kerry Group's sustainability strategy, includes ambitious sustainability targets that address key impacts by 2030 in the areas of nutrition and health, emissions, circular economy, raw materials, and social impact.

KHNI
Kerry Health and Nutrition Institute™

Better for People

Reaching over **two billion people** with **sustainable nutrition** solutions by 2030

1billion+
We currently reach over one billion consumers with positive and balanced nutrition solutions.

Better for Society

Upholding our **values** and internationally recognised **human rights**

Ensuring a **safe** and **healthy workplace**

Achieving the highest levels of **diversity**, **inclusion, belonging** and **engagement**

Engaging in **community partnership** that deliver impact

Making the **science of healthier food accessible** through Kerry Health and Nutrition Institute

Better for Planet

Climate Action

Scope 1 & 2
(Kerry owned facilities ie. milk processing sites)
Adopting a Science Based Target for a **55% carbon reduction** by 2030 and achieving **net zero** before 2050

100% Renewable Electricity
within 12 months

Scope 3
(farm related emissions)
Working with suppliers to **reduce emissions** intensity by **30%** across our supply chain

Water Intensity
Achieving a **15% reduction** in water intensity by 2025

Circular Economy

-50%
Cutting our **food waste** by 2030

100%
of our plastic will be **reusable, recyclable or compostable** by 2025

Zero
Waste to Landfill by 2025

-25%
Achieving 25% **reduction** in **virgin plastic** use by 2025

Responsible Sourcing

100%
of priority raw materials **are responsibly sourced** by 2030

Evolve Reward Potential

*Based on the average Kerry Agribusiness Milk Supplier (80 Cows/420K Litres).

KERRY

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