



firstmilk™
The Regenerative Co-op

**Regenerating
the earth
every day**

First Milk Regenerative Farming Programme

Regenerative farming – promoting grass-based dairy farming as a climate solution

It is clear our global climate is changing, and we are seeing disruption all around the world. Here in the UK, we are seeing more variable weather than ever before, and it is already impacting forage production and milk production volumes. Becoming more resilient to this is critical for the long-term success of dairy farming, and it is important we play our part in addressing this challenge.

Within this, we need to use nature to help capture CO₂ and put it back underground. The depletion of biodiversity is an equally important societal and resilience issue, our aim is to reverse this loss. We are doing this by taking a regenerative approach, centred around working with nature and mimicking natural processes wherever possible. We believe the overall impact

of these actions will regenerate the earth and make it a better place for everyone. This is not only a moral imperative, but also a commercial one. Every day, we see increased consumer and customer interest in this area.

Our regenerative farming programme continues to gather momentum and is the largest programme of its type in the UK dairy sector. First Milk members continue to make progress, with more regenerative practices being applied across a wider land area year-on-year.

In 2024, our members have committed to 261,340 regenerative interventions across 84,623ha of land, with an average of 11 interventions per land parcel. This is up from 163,834 interventions (averaging 7 per land parcel) across 84,118 ha in 2023. In 2022, the first year of this programme, members committed to 130,873

interventions on 78,399 ha of land, with an average of 6 interventions per land parcel, so the number of regenerative interventions has more than doubled in two years.

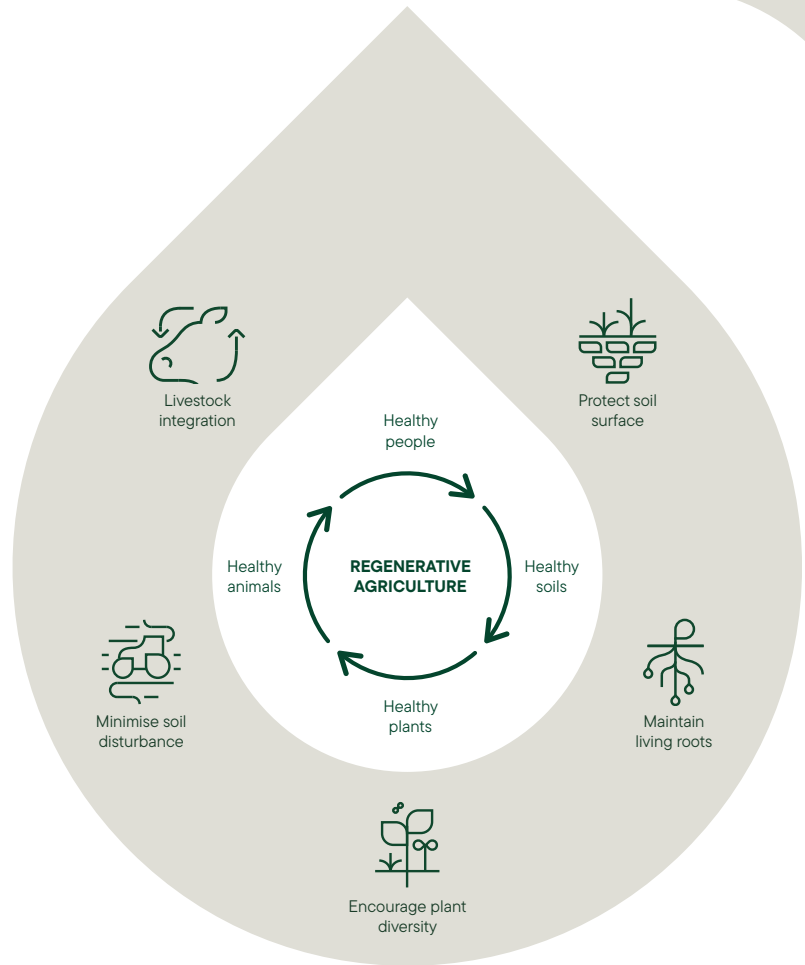
Over half of the land being farmed regeneratively is rotationally/mob grazed with 69% of pasture containing multi-species. Calculations show First Milk member farms have already increased milk from forage by 10% and are sequestering more than 100,000 tonnes of CO₂, ahead of our 2025 goal, and antibiotic use is well below national targets.

This booklet outlines what we believe are the principles of regenerative farming and why they are important to producing healthy, thriving farm systems.

Mark Brooking
Chief Impact Officer

Regenerative Farming

Regenerative farming is where food production complements the local and global environment. A healthy and vibrant soil is central to this philosophy and achieved by following these principles.



Healthy soil

The importance of healthy soil

Healthy soils recycle more nutrients, store more water and require fewer inputs to be productive. This in turn leads to healthier plants and healthier animals producing nutritious food.

Assessing soil health

Assess the health of your soil by digging out a square and examining it for the following:

- **Colour:** is the soil uniform in colour throughout or is there a difference between the topsoil and subsoil? Or any orange mottling to indicate waterlogging?
- **Smell:** does the soil smell particularly acidic or stale?
- **Rooting dynamics:** is compacted soil causing matting or shallow rooting of crops/grassland?

- **Worm count:** a healthy UK grassland soil is expected to contain 10-15 earthworms per soil pit. It is best to do worm counts in spring and autumn when conditions are conducive to worm activity. By repeating counts at the same time each year, changes in the relative worm population can be monitored.
- **Soil test:** if applying fertiliser or manure to land, soil must have been tested within the previous five years for pH, phosphorus, potassium and magnesium. Regular soil testing indicates if there is a particular nutrient deficiency or excess limiting the consequent yield of the crop grown.

Improving soil health

Soil health can be improved and 'grown' by adopting the regenerative farming practices detailed in this booklet. Among the significant benefits seen are the increases in organic matter and carbon content.





Integrate livestock

The integration of livestock is central to regenerating soils through the addition of organic matter via dung and the action of 'golden hooves' trampling organic matter into the soil surface and stimulating soil life.

Soils with higher organic matter benefit from increased soil health and structure, allowing improved water infiltration, greater water-holding capacity and greater ability to store nutrients and carbon.

To gain maximum benefit from livestock integration, carefully managed rotational grazing is crucial. Grazing to the correct height provides a good basis for forage production. Measuring sward height helps maintain a productive ley and reduces the likelihood of overgrazing and impaired plant productivity.

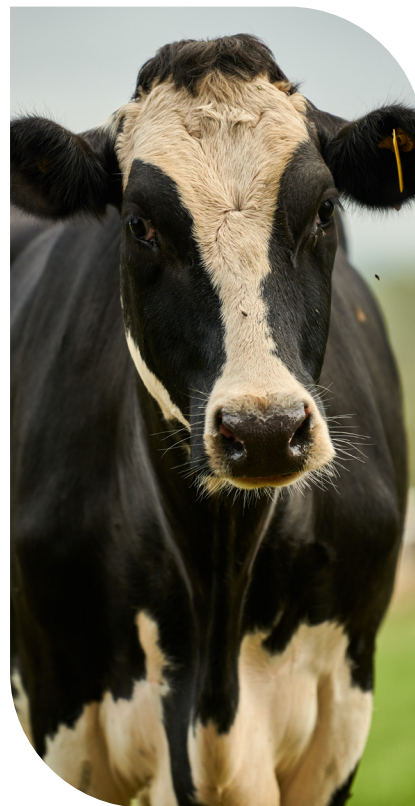
Rotational grazing systems result in greater sward height following rest

periods of 21 days or more. When a sward is cut too close to the soil surface, 'scalping' can create areas of bare soil vulnerable to degradation, run-off after heavy rain and 'sun-baked' soil slowing grass recovery.

Alongside livestock, dung beetles are particularly important in grassland as they breakdown manure to aid soil fertility. Encouraging beneficial species reduces the reliance on chemical parasite control which may be returned to soil in manure causing unintentional consequences to soil fauna.

How to integrate livestock

Replicate 'natural grazing' by rotationally grazing cows, aiming to graze as many fields as possible at least once a year. Leave a reasonable amount of grass and manure behind, followed by longer rest periods giving plants time to recover.





Minimise soil disturbance

Soil disturbance through cultivation breaks up the network of mycorrhizal fungi attached to plant roots enabling crops to access nutrients. It also causes soil to burn up organic matter and release CO₂. Ploughing a field releases approximately three tonnes of CO₂ per hectare; more if you cultivate vigorously.

How to minimise soil disturbance

Where possible avoid ploughing and/or other cultivation and consider using methods of crop/ley establishment which disturbs the soil least. Extensive soil cultivations are usually chosen because of compaction problems and the depletion of leys. Preventing these issues and using techniques such as direct drilling (possibly preceded by

sub-soiling or swardlifting) can save time, cost and soil disturbance.

Artificial fertiliser/sprays can disrupt soil biology and make plants dependent on these chemical fixes. Healthy soils and plants communicate through a network of fungi and plant exudates, assisted by only applying what is necessary. Fertiliser applications should be tailored in both amount and type, based on regular soil tests.

Soil health facts



Soil contains 4 times more carbon than all the plants and trees in the world



Increasing soil depth by 1mm is equivalent to 10 tonnes per hectare



A teaspoon of healthy soil contains more organisms than there are people on the planet



The weight of organisms below the soil surface is equivalent to 80 cows per hectare in a permanent pasture



Protect soil surface

Bare soil with no 'armour' to protect it is exposed to extremes of hot and cold. Rain washes away topsoil more easily and wind can blow baked soils into the air.

Good land management increases the structural resilience and stability of soil. Soil able to withstand more extreme weather patterns provides better yield protection for grass/crop production and more economic security for a farm business.

Climate change and the altering environmental conditions require soils to adapt to longer periods of both dry and wet weather.

Deeper rooting systems can extract water from a greater depth making them more drought tolerant, and different root structures can correct other underlying concerns such as compaction or a low organic matter content.

Diversifying swards and implementing cover or companion cropping increases transfer of air and water into the soil, benefiting life above and below ground.

How to protect the soil surface

Build the organic matter content of soil to increase its waterholding capacity and reduce direct losses through erosion and run-off by, for example, undersowing arable crops or using cover crops after maize. Also allow grassland to grow taller before grazing, not being afraid to let cows trample some grass down into the soil. Resist topping pastures to make them look tidy.

Maintain soil cover to slow the impact of rainfall and provide a growing plant to mitigate degradation. Vulnerable times include post-harvest of combinable crops, over-wintered stubbles and maize land without cover crops.





Increase species diversity

Above ground diversity of crops leads to below ground diversity, as different species of plants associate with different soil organisms, providing nutrients for the natural food web. Different organisms are responsible for different nutrient cycles and the soil food web functions at its best when as many of these relationships are present as possible.

A multi-species sward can extend grazing periods and be more resilient, as well as provide a more nutrient-rich diet. Mixed species also complement and benefit each other. The nitrogen-fixing ability of clover assists grasses, while deeper-rooting plantain and chicory help combat compaction and aid root growth of neighbouring plants. The roots of different plants use sunlight to deposit carbon, and the broader rooting system from herbal leys increases the potential for gas and water exchange.

Sites must be assessed carefully before introducing additional species. If a field is already within a rotation, increasing diversity is relatively simple by introducing a catch, cover or companion crop. If a field is long-term permanent pasture, or a sensitive habitat area, more sympathetic measures must be undertaken to preserve the existing ecology and benefits the land provides. Time of year, soil condition and how the land is being used (grazed, silaged, harvested) all influence the best establishment method.

Growing cover crops increases soil organic matter and provides a break within the rotation. This opportunity to refresh the soil and provide rooting and residue variety helps stimulate the organisms below ground. Species selection is often guided by other crops in the rotation and a requirement to provide extra forage for grazing livestock.

How to increase species diversity

When reseeding, consider using a multi-species mixture, containing different types of grass, legumes and herbs. Alternatively, oversowing into existing leys by direct drilling or using a fertiliser spinner can also increase the diversity of grass leys. Ask your agronomist/seed merchant what works well in your area and the best time to sow.





Maintain living roots

Soil organisms need feeding, relying on the nutrients provided by living plants. In an absence of plants, these organisms begin to die off. By maintaining a living root, soil is continuously being built, using sunlight to drive carbon into the soil. It also helps minimise soil erosion as the plants and their roots prevent run off.

How to maintain living roots

Make sure there is always a living crop in the ground, whether the next growing crop or a cover crop. Ask your agronomist/seed merchant for advice on options for keeping a living root in your soil all year.



Summary

We believe First Milk members' farms will be more resilient if we increase soil organic matter and introduce greater ground cover, provided by longer sward residuals and multi-species, deeper-rooting leys.

Implementing one or two regenerative practices in isolation is unlikely to be effective. Introducing a herbal ley into a soil subject to intensive cultivation, fertilising and spraying for a number of years is likely to result in a poor crop. The benefit of clover/legumes is their root nodules hosting beneficial bacteria which undertake nitrogen fixation. If these bacteria are absent from the soil due to previous farming practices, the legumes will not immediately flourish – there is a transition period. Unless soil biology is allowed to re-establish, the cycle of chemical dependency continues.

Regenerative farming is about working with natural processes. There is still a place for fertiliser and sprays, but like antibiotics, only when necessary, and with a review to assessing how their use might be reduced in future.

The many benefits of following this approach include up to 50% of carbon emissions associated with milk production being stored in soils annually. In doing so, First Milk members will not be as reliant on expensive inputs and their cows more likely to have a nutrient-rich diet requiring less intervention.

Find out more

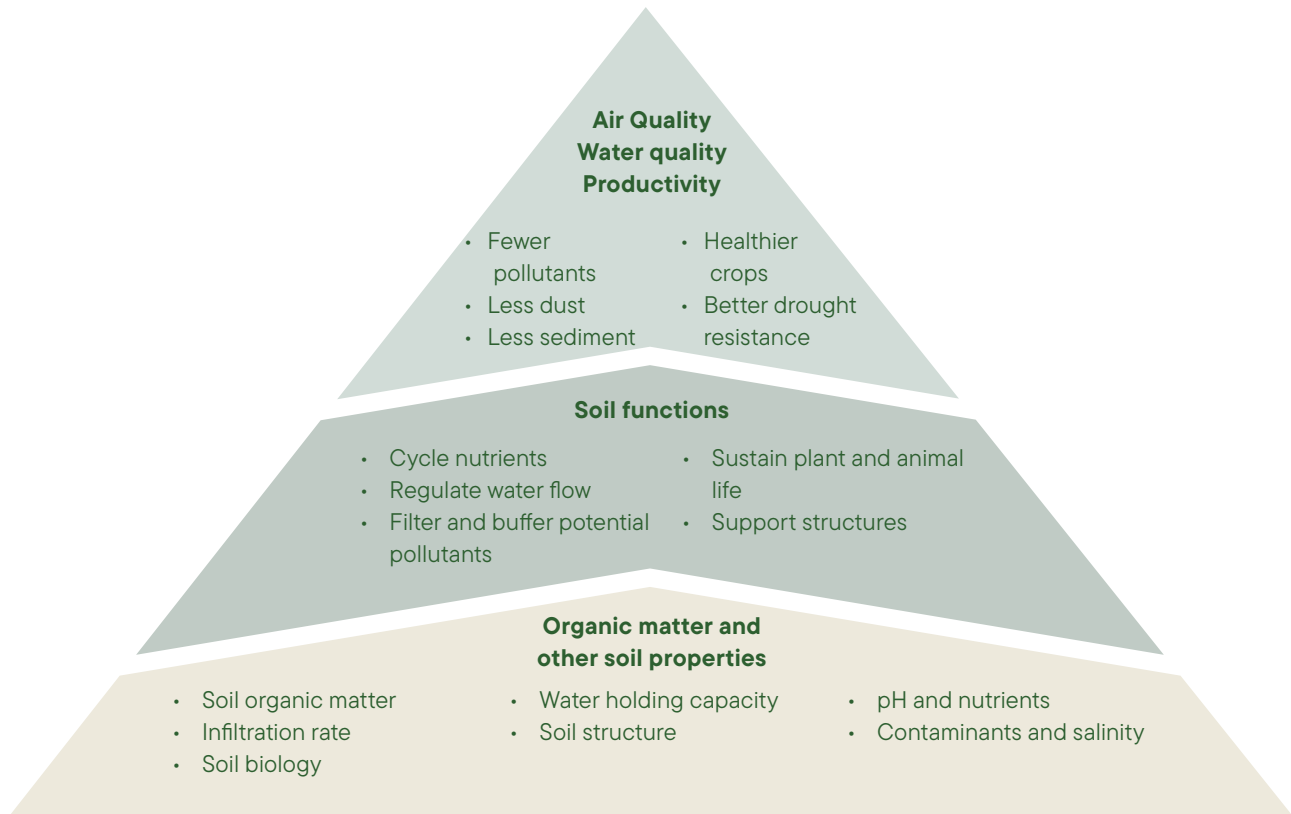
First Milk Resource Hub/Regenerative Agriculture



First Milk Regenerative Farming workshops how-to videos



Soil Quality: the foundation of regenerative farming



Source: USDA

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The Regenerative Co-op

Telephone: 0141 847 6800

Email: membershipteam@firstmilk.co.uk

First Milk Limited, 1 George Square, Glasgow, G2 1AL

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**Farm
Carbon
Toolkit**

