

Focus on: dairy

62 per cent of dairy farmers surveyed in 2010 believe climate change will impact their business in the next 10 years and 45 per cent are already taking action to reduce greenhouse gas (GHG) emissions from their farm.

Producing more while impacting less is becoming a familiar mantra in farming. Low farm gate prices and rising input costs coupled with food security issues and government targets to reduce GHG emissions mean that dairy farmers are rethinking how to keep their businesses profitable. Key to all of these issues is efficiency, and there are steps that as a dairy farmer you can take to improve your bottom line and reduce your impact on the environment.

The dairy sector is already demonstrating success in this area – see the [Milk Roadmap: One Year Down the Road \(2009\)](#) for more information. Reducing water use, nitrogen run-off and enhancing biodiversity are just some of the issues dairy farmers are making good progress on.

KEY OPPORTUNITIES:

- Capitalise on the increasing demand for food with a lower environmental impact.
- Increasing the efficiency of milk production can reduce GHG emissions.
- Investment in energy and water audits and efficient technologies can reduce costs.
- Diversifying into on-farm renewable energy generation can be profitable.

KEY CHALLENGES:

- Reducing ruminant emissions through breeding strategies, improved feeding and fertility.
- Reducing production losses from disease through improved animal health.
- Improving nutrient and grassland management to increase forage availability, reduce nitrous oxide (N₂O) and ammonia emissions and increase carbon storage.

DID YOU KNOW?

- Dairy farming accounts for 30 per cent of the agricultural sector's methane emissions.
- Methane accounts for nearly 50 per cent of GHG emissions from dairy farms while electricity and fuel accounts for just six per cent.
- 2-12 per cent of energy intake is lost as methane.
- 55-95 per cent of nitrogen ingested is excreted.
- The floods of 2007 resulted in the loss of 2-3 litres of milk/cow/day in many dairies, due to stress and change of diet.
- The UK imports £2bn worth of dairy products compared with exporting only £0.8bn.
- There are 1.9 million dairy cows in the UK with an average herd size of 112 cows, compared to the EU15 average of 42 cows per herd.





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REDUCE EMISSIONS AND IMPROVE PRODUCTIVITY

In the Government's [Low Carbon Transition Plan](#) (July 2009) England's farmers were challenged to reduce their GHG emissions by 11 per cent by 2020. Dairy farmers have a significant role to play in helping the industry meet this target. Improving the efficiency of milk production will be key. Many of the actions to reduce emissions will improve profitability as well as enhance the resilience of your business to the impacts of climate change and depleting natural resources.

Feed and forage

- Understanding the [Feed Conversion Efficiency \(FCE\)](#) (ratio of milk yield to dry matter intake) of your herd will lead to better margins and help reduce GHG emissions. You should be getting about one litre of milk from every kilogram of dry matter eaten by the cow and DairyCo estimate that efficiency can be increased by around 8.5 per cent on farm.
- Different plant species such as clover can help to increase feed intake, improve milk yield and reduce GHG emissions. Clover can also reduce the need for applications of N and improve the overall nitrogen use efficiency of the herd.
- Roughly 70 per cent of agricultural land in the UK is grassland, which is a valuable carbon store. Pasture-based dairy systems can demonstrate greater sustainability credentials due to this storage, but also because it reduces the amount of concentrate feed required to supplement diets.

Manure and nutrient management

- Optimising nitrogen inputs can reduce emissions of N₂O from soils and manure applications, reduce leaching into watercourses and save you money. An approved nutrient management plan (e.g. Tried & Tested) is a useful way to analyse your nutrient inputs and losses. Specific guidance for different farming systems on efficient fertiliser inputs to grass can be found in the latest edition of the [Fertiliser Manual \(RB209\)](#).
- Ensure adequate manure management facilities and practices to reduce methane and N₂O emissions and comply with NVZ regulations (e.g. a roofed, deep and compact surface area store will reduce rainwater infiltration and risk of leaching).

Energy efficiency

- Better [energy management](#) and more efficient equipment can lead to significant savings in both cost and GHG emissions associated with fuel and electricity. For a typical 150-cow herd, investing in heat recovery with a [Carbon Trust interest-free loan](#) could save you up to £650 per year.
- Alternative stock management practices, such as outwintering of cattle, could also reduce energy use from housing, but will depend on location and soil type.

Renewable energy

- Manures and slurries can be used to generate renewable energy via [anaerobic digestion \(AD\)](#). This could be used to power farm buildings or sold back into the Grid. AD can also reduce local food waste and generate an organic fertiliser called digestate.
- Suitable locations could also generate [wind power](#), hydropower, [biomass for renewable heat](#), ground source heat, or solar PV. Better tariffs for renewable electricity are now available through the [Feed-in Tariff \(FiT\)](#) and a Renewable Heat Incentive is under consultation.

ACTIONS:

- Reduce methane emissions: improve feeding efficiency (including feedstuffs, feeding frequency, forage species used, forage preservation and processing) by reducing fibre and N intake, and increasing dietary concentrates, maize silage, and starch and sugar for example.
- Technology (e.g. slurry injection, trailing shoe) for more targeted application of slurry and manure to reduce use of inorganic fertilisers and associated emissions. Be aware of the cost implications and impacts on soil structure.
- Contact Tried & Tested (Call 02476 858896 or email nutrientmanagement@nfu.org.uk) or your local [England Catchment Sensitive Farming Officer](#) for a nutrient management plan and professional advice on optimising nutrient inputs.
- Read the new fertiliser recommendations (RB209) for specific guidance (www.defra.gov.uk/rb209).

- Improve grassland management to reduce soil damage and protect grass for carbon storage. Try to lengthen the life of a field, rather than ploughing and re-seeding. For worn-out pastures consider slot-seeding with high sugar grasses and clover to improve productivity and therefore also reduce emissions.
- Explore opportunities to reduce energy consumption. For example insulate hot water pipes in parlours or consider more efficient systems for milk cooling. Interest-free Carbon Trust loans are available for improving the energy efficiency of your business. Call 01865 885846 or visit www.carbontrust.co.uk/loans to find out if your project qualifies.

BE PREPARED FOR CHANGES IN CLIMATE

Most climate change projections suggest long-term trends towards hotter, drier summers, milder, wetter winters, and more unpredictable or extreme weather events.

Water

- Save costs by reducing your water footprint. Start with a water audit and if it is suitable to do so, invest in a rainwater harvesting system (See Farming Futures' video case study).
- Increased heavy rainfall events during winter could increase the risk of flooding. Understand where your land is at risk and ensure livestock are moved to higher ground during flood warnings.
- Clean/dirty water separation can be an extremely cost-effective intervention. Preventing water coming into contact with contaminated yards or slurry will reduce the amount of liquid waste to be stored and disposed of, and will also reduce diffuse water pollution from your farm. Clean water can be harvested and stored for later use.

Grassland management

- Higher soil temperatures as a result of a warming climate could support longer periods of forage growth, allowing longer grazing seasons.
- Raised CO₂ levels in the atmosphere will lead to higher grass growth rates. However, it will also result in reduced feed value, as it will promote sheath growth as opposed to leaf growth, thus reducing digestibility.
- Limited water availability and heat stress in summer could mean less forage available in some regions. This could impact upon the volume and quality of second silage cuts.
- Prolonged dry weather may increase the need to supplement forage with bought-in feed and silage, potentially increasing feed costs.

Stock management

- Adverse weather conditions may increase the maintenance requirement of stock (e.g. housing during extreme weather), so milk production efficiency could be reduced.
- Heat stress effects on production (e.g. changing nutritional requirements, reduced feed intakes, poor reproductive performance and reduced yields) from increased temperatures and humidity in summer and autumn will need careful management. A cow's preferred temperature is just 5C so they can easily overheat in the warmer months.
- A warmer climate may mean an increased threat from insect-borne diseases.

Actions:

- Complete a farm water audit to identify ways to reduce waste and lower costs then consider installing a rainwater harvesting system. Read the Environment Agency's guide to on-farm rainwater harvesting and Dairy Co's advice on farm water use for more information.
- Sow some deeper-rooting forage varieties that can cope with drier climates e.g. lucerne, forage maize, and chicory and consider establishing pasture with a diverse range of plant species that are more resilient to grazing pressure in poor conditions.
- Improve soil and grazing management to ensure forage quality and growth rates are maintained. This will help improve livestock fertility and milk yield and measures to reduce erosion will increase carbon storage in soil. Read our soil management fact sheet to find out more or visit the DairyCo grassland management web pages.
- Consider integrating maize and whole-crop cereal silage as a hedge against grass failure.
- Continue to move water and feeding areas around fields to reduce poaching in line with cross compliance requirements.
- Sign up to flood alerts by calling the Environment Agency flood line on 08459 881188.
- During times of flood risk, keep livestock off wet soils and away from watercourses or consider housing. Also consider drain and ditch renovations as well as moving gateways to ensure contaminated water and soil is not channeled into watercourses and roads.
- Assess how your buildings, dairy parlour and business will cope with extreme weather events (e.g. flooding). If necessary develop a contingency plan for the storage and transport of milk and seek advice from your insurance company.

IMPROVE ANIMAL HEALTH AND WELFARE

- Good herd health and welfare is an important part of increasing productivity and maintaining profitability, whilst reducing emissions and coping with climate change impacts. Disease can raise costs through its impact on reduced production, cow longevity and increased veterinary bills.
- A warmer climate and increased globalisation and trade may introduce a wider range of vectors and parasites and thus increase the risk of new and emerging diseases.
- In the UK the average lifespan of a dairy cow is increasing and now stands at 3.6 lactations per cow, despite the increase in outbreaks of exotic diseases and continued spread of bovine TB. The Farm Animal Welfare Council (FAWC) suggests that farmers should be able to achieve 4.3 to 4.9 lactations per cow – improving cow health and fertility will help farmers continue to increase longevity and therefore improve production efficiency and reduce emissions.



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- Selecting for breeding traits that support increased yields and health and disease resilience in a warmer and more variable climate, will reduce emissions, improve margins and increase longevity. Health and welfare should be considered as an integrated part of profitability alongside milk yields.
- Cow health and welfare will benefit from suitable protection from extremes in weather (e.g. shade during periods of high summer temperatures).

Actions:

- Be vigilant for new pests, diseases and weed invasions and inform your local vet if anything unusual occurs.
- Ensure your farm has adequate bio-security measures in place at all times to avoid introducing new threats and consider the quality of the source of any new cattle.
- Develop an animal health and welfare plan with your veterinary advisor to ensure that current health problems are reduced and productivity increased.
- Keep a high level of hygiene on your farm to avoid maintaining pests and diseases.
- Rotate grazing to avoid transmission of diseases or parasites that establish on certain fields.
- Improve ventilation and temperature control in livestock housing and transport and carefully manage stocking density. See Carbon Trust and NFU guides for more information.
- Ensure plenty of drinking water (up to 120 litres/cow on hot days depending on dry matter intake and milk yields), plant or provide in-field shade areas and ensure sufficient airflow by removing side cladding and putting holes in the roof of collecting yards to prevent heat stress.
- Consider the direct effects that climatic variations and change can have on feed intake and health. Speak to your nutritionist or DairyCo extension officer to find out more.

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PROFITABLE BUSINESS IN A CHANGING CLIMATE

For news, events, and links to stories about how other farmers are managing climate change on their farms, please visit: www.farmingfutures.org.uk

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