

GREENHOUSE GAS EMISSIONS: THE TRUTH BEHIND THE DAIRY SECTOR'S CARBON FOOTPRINT

PREPARED BY



Greenhouse gases - why should we worry?

Greenhouse gases (GHG) are gases in the earth's atmosphere which absorb and trap energy from the sun.

While some of this heating process is natural and vital for warming the surface of the planet, human activities have increased production of these gases — most notably carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) — which are contributing to rising global temperatures.

This rise in temperature creates more volatile weather conditions, changes to our ecosystems, and is causing sea levels to rise.

To help the UK play its part in combatting the problem, the government has pledged to help the country reach net zero emissions by 2050. The National Farmers Union has also committed to helping agriculture work towards a similar target by 2040.

Cattle's contribution to GHG emissions

Livestock production, particularly cattle farming, has received a lot of negative media attention in recent months for its perceived role in raising GHG emissions.

While it's true that cattle do contribute to the production of GHGs, it's not the case that they are a main cause of climate change.

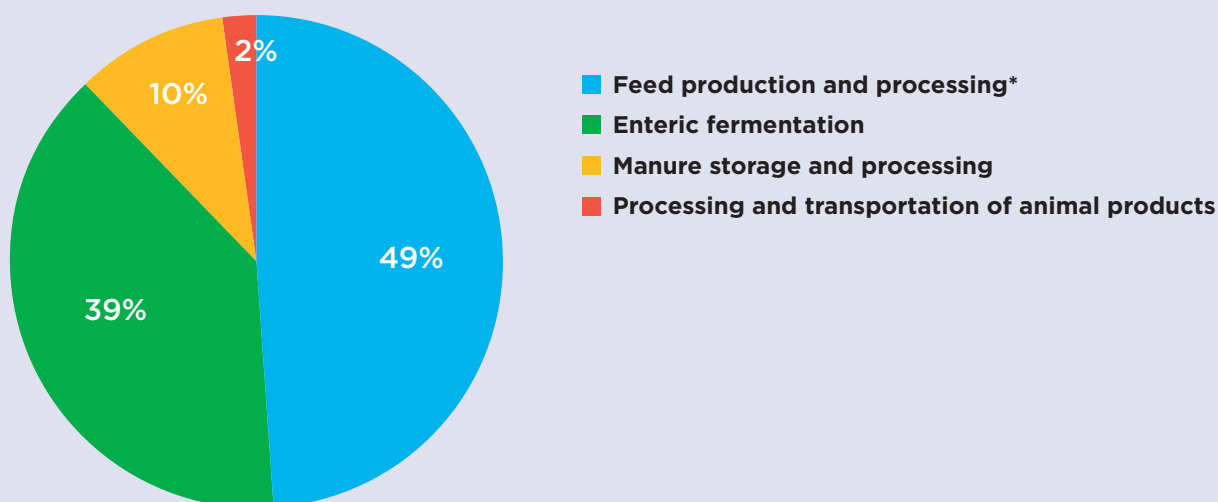
In fact, with the right management, livestock — particularly dairy cattle — can actually play an important part in supporting the planet.

How do dairy cows produce greenhouse gases?

Methane is produced during enteric fermentation in the rumen and from stored manures, while nitrous oxide is produced as a result of soil management and the application of manures and fertilisers.

Carbon dioxide production is related to manufacture and use of fertilisers (where fertiliser is used for crops grown as feed for dairy cows).

Sources of emissions from global cattle production



*Figure includes emissions associated with expansion of pasture and feed crops into forests (9% of total sector emissions) and fossil fuel use (20% of sector emissions).

Source for all stats in this section: <http://www.fao.org/3/a-i3437e.pdf>

Dairy's global footprint

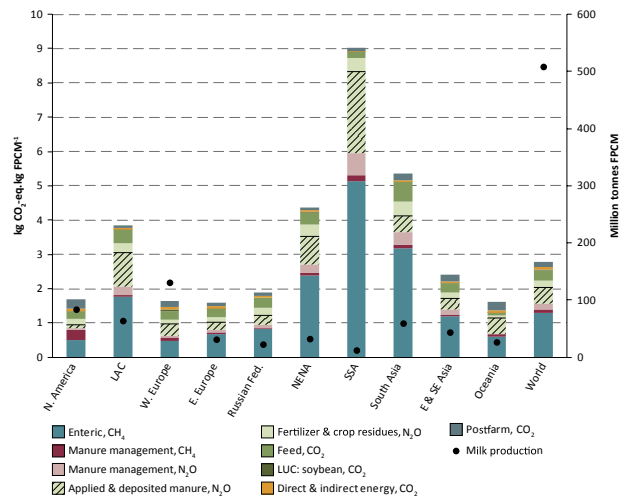
Across the world, dairy production is responsible for about 3% of GHG emissions¹.

Emissions vary hugely between countries and regions due to differences in production systems, feed quality, genetics, fertiliser use, and supply chains.

In industrialised countries efficient production systems have helped to reduce cattle numbers and lower emissions whilst maintaining or even increasing production levels.

Less-developed regions however see much higher emissions from enteric fermentation due to poorer nutrition and genetics, while emissions from manure application and management are also a major emissions source.

FIGURE 9. Regional variation in cattle milk production and GHG emission intensities



Source: GLEAM.

Figure. Source: <http://www.fao.org/3/a-i3437e.pdf>

GHG from livestock - the stats

- Global GHG emissions from livestock are about 7.1 gigatonnes CO₂e* per year, representing 14.5% of all man-made emissions
- Dairy production accounts for 41% of global livestock emissions (about 3% of total global GHG emissions)
- Feed production and processing and enteric fermentation from ruminants are the two main sources of emissions from global dairy production

*Carbon dioxide equivalence (CO₂e) is a unit used to measure carbon footprints. The measurement works by expressing the impact of different greenhouse gases in terms of the amount of CO₂ that would create the same degree of warming. This way, a carbon footprint consisting of lots of different gases can be expressed in a single number.

How UK dairying compares

While there's always more producers can do to help reduce emissions, UK dairy farms already have some of the lowest carbon footprints on the planet.

According to government figures, British agriculture is responsible for 9% of the country's total emissions, with the dairy sector responsible for less than 2% of that figure².

Per litre of fat-corrected milk, the average carbon footprint for milk production is just 1.25kg of CO₂e³.

Compared to other industries, agricultural emissions are dwarfed by other sectors such as transport and energy.

Industry	CO ₂ e (million tonnes)
Transport	121.4
Energy from power stations	65.2
Energy from other supplies	33.1
Business	65.9
Residential	65.9
Industrial process	10
Agriculture	5.6

Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/790626/2018-provisional-emissions-statistics-report.pdf p6

Carbon footprint comparisons:

- Heating a UK home for a year: 2.35t CO₂e⁴
- One London to Rome flight (per passenger): 243kg CO₂⁵
- A 100 mile car journey: 17.1kg CO₂⁶
- Producing 1 litre of milk: 1.3kg Co₂e⁷

While improved genetics, production efficiencies and streamlined supply chains all play their part, our climate also makes UK dairying incredibly well suited to climate-smart agriculture.

Our mild, wet weather is perfect for growing grass for grazing, helping make use of marginal land which might otherwise be unsuitable for crop production.

Grazing livestock has also been proven to be beneficial to the environment. Not only do grazing cattle return nutrients and organic matter back to the soil, but grassland also acts as a carbon sink, taking carbon out of the atmosphere.

What you can do to reduce emissions

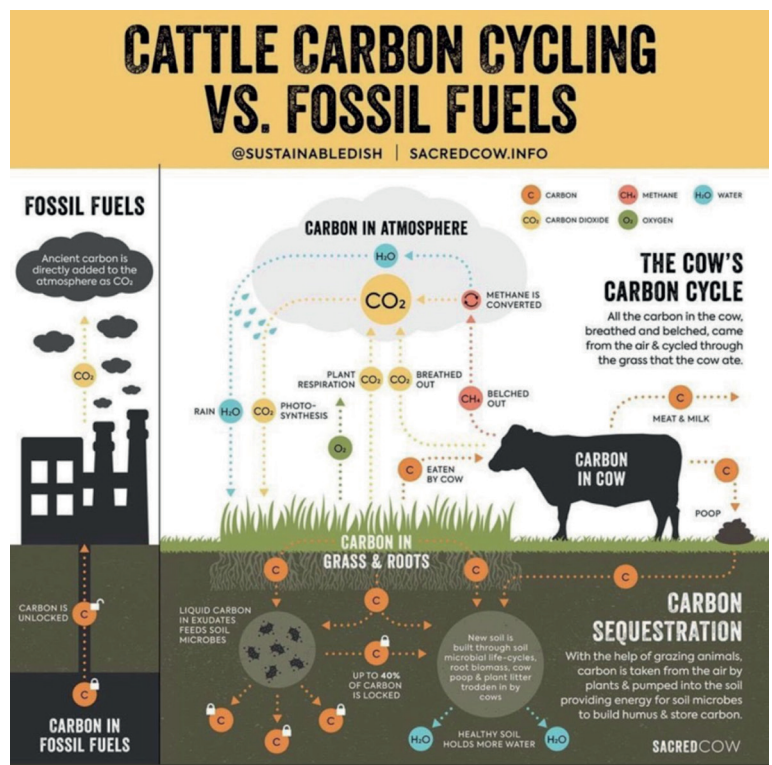
There are a range of measures dairy farmers can take to reduce emissions, ranging from updating manure storage and modifying diets, to adopting energy saving practices and increasing livestock efficiency.

Not all of these will be affordable or available to every business, so it's important to get advice and understand which measure - or combination of measures - will work best for you.

It's important to remember emissions from farming come from on and off-farm processes, so simply looking at GHG emissions in one area isn't necessarily helpful.

Mitigating emissions needs to look at the entire production system, which is where environmental assessments and life cycle analyses can help.

Reducing emissions is also an opportunity to look at farm efficiencies: understanding a farm's GHG emissions can offer a variety of benefits, such as reducing waste or reducing energy bills.



¹ <http://www.fao.org/3/a-i3437e.pdf>

² https://dairy.ahdb.org.uk/media/623464/greenhouse_gas_emissions_on_british_dairy_farms.pdf

³ Alltech data from UK dairy farms - sourced from retail contracts, schemes or volunteered, 2019

⁴ <https://www.theccc.org.uk/wp-content/uploads/2016/07/5CB-Infographic-FINAL-.pdf>

⁵ <https://www.theguardian.com/environment/ng-interactive/2019/jul/19/carbon-calculator-how-taking-one-flight-emits-as-much-as-many-people-do-in-a-year>

⁶ <https://www.bbc.com/news/science-environment-49349566>

⁷ https://dairy.ahdb.org.uk/media/623464/greenhouse_gas_emissions_on_british_dairy_farms.pdf