Working towards net zero carbon emissions

How do we reduce emissions from beef ?

Practical Guide

With Scotland working towards net zero carbon emissions by 2045, the Scottish agricultural sector has a key role to play. The focus isn't on reducing the number of livestock, but instead about how we can make our production more efficient to reduce greenhouse gas emissions, in tandem with locking more carbon onto the farm.

Improving on-farm efficiencies strongly correlates with **reduced production costs per kg of beef** sold, increasing profitability for the farm business. Making better use of inputs and improving livestock productivity helps to reduce emissions. We also have the scope to lock carbon into the farm, providing opportunities for offsetting individual farm emissions.

Reducing greenhouse gas emissions represents a challenge, but one with clear opportunities.

This Practical Guide introduces some ideas that we can all consider to improve profitability and reduce the carbon footprint from the beef enterprise.

So what practical measures can we consider?

There's no 'one size fits all', but a range of ideas that you can pick from and adapt to suit to your farm, improving profitability and environmental performance. General principles include:

- ✓ Improving and protecting soil health - healthy farm soils could increase the grazing season and improve stock carrying capacity.
- ✓ Nutrient management - optimum nutrient and pH management could save on the fertiliser bill; appropriate and timely application could further reduce the risk of greenhouse gas losses.
- ✓ Grassland management - improved grazing and pasture management could help you get increased growth from grass.
- ✓ Breeding and fertility management - getting cows in calf
- ✓ Calf management - weaning % and liveweight gain
- ✓ Feeding and rations - cost effective and faster finishing
- ✓ Health and disease management - making sure the whole herd is healthy and performing as well as possible.

A number of our practical guides cover these topics in more detail. We take a brief look at some of them overleaf:

This practical guide is part of a series looking at steps you can consider to reduce emissions whilst maintaining a profitable farm business. For more information, tips and ideas and to read what other farmers have done, visit ***www.farmingforabetterclimate.org****. Find us on* ***Facebook*** *and follow us on* ***Twitter*** *@SACFarm4Climate.*

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Practical ideas to consider

Improvement in productive efficiency is the most important factor that farmers have within their control to reduce emissions and positively **steer profit.** Findings from the Climate Change Focus Farms show that greenhouse gas emission reductions are achievable, even on already technically efficient farms **and** compatible with maximising farm profits.

Example efficiency measure 1 — Increase calf sales

Ensuring suckler cow fertility is not unduly compromised is an essential aspect of maximising live calf numbers. This includes good husbandry practices such as selecting replacements from fertile stock, use of EBV's, bull fertility checks, condition scoring cows, good grassland management, biosecurity measures, health planning and many other small but cumulatively significant practices.

Using SAC data it was shown that achieving 5% greater calf numbers reducing barren cows and calf mortality could improve finisher cattle sales by **over 3t liveweight per 100 cows** and reduce greenhouse gas emissions by 10% per kg carcase weight.

Example efficiency measure 2 — Improve nutrient use

Targeting and applying manure and fertiliser to meet crop requirements is an effective method of reducing purchased fertiliser cost and increasing nutrient utilisation (minimising nutrients lost to the environment) without compromising crop yield. A 10% reduction in fertiliser purchase could reduce the carbon footprint by 2% per kg carcase weight.

Example efficiency measure 3 — Improve forage quality

Healthy soils, unimpaired field drainage, modern grass varieties and timely field operations present an opportunity to increase forage quality without compromising yield. Improved forage quality will encourage intakes, promoting young stock growth-rates or off-set purchased feed use.

Improving grass silage energy content by 1MJ/kg DM over six-month feeding period is equivalent to around **90kg barley or an additional 35kg live weight in a growing beef ration**.

Next steps?

- ✓ If you haven't already, complete a carbon footprint for your farm. This will allow you to benchmark your livestock enterprise with other like businesses. How do you compare and which areas could be more profitable for you?
- ✓ Take a look at the other Practical Guide titles in this series (via our webpages). Is there anything you could do differently to benefit your farm and reduce greenhouse gas emissions?
- ✓ Review your carbon footprint on an annual basis. Develop an action plan based on technical performance targets. This should aim to take one step at a time towards a more efficient, lower cost system with a reduced carbon footprint, helping to demonstrate an ongoing move towards net zero carbon emissions from Scotland's agricultural sector.

What are the main emissions from farms and where do they come from?

Greenhouse gas emissions from farms with livestock include **carbon dioxide** (CO_2), produced by burning fossil fuels, for example tractor operations and shed lighting, **methane** (CH_4) as a natural by-product of ruminant animal digestion and **nitrous oxide** (N_2O) released from soils, manure and other fertilisers.

Methane and nitrous oxide are both powerful greenhouse gases, 34 and 289 times more potent than carbon dioxide respectively. This increases the scale and potential impact agricultural practices have on climate change.

Switching land use, e.g. changing from arable to grassland, or tree planting in suitable areas on the farm can have an impact. This process of locking carbon into the farm is known as *carbon sequestration*.

Carbon footprinting

A carbon footprint (CFP) highlights greenhouse gas emissions across the business. Some CFT tools benchmark with other like enterprises. If emissions seem high when compared with similar businesses, this could reflect poor utilisation of costly inputs, giving scope to implement efficiency savings - benefiting both the farm business and the wider environment. AgRECalc is the free CFP tool used by the Beef Efficiency Scheme.