

# Farming for a Better Climate



## Improving Farm Efficiency; Findings from Woodhead Farm

Woodhead Farm is a 180 cow dairy unit over 141ha near Newmilns in Ayrshire. The farm is family owned and run in partnership by mother and son team, John and Anne Kerr. John and Anne have worked with SAC Consulting as one of nine Climate Change Focus Farms under the second round of the Scottish Government funded Farming for a Better Climate initiative between 2014 and 2018.

At the start of the project, cropping at Woodhead was predominantly grass, with 16 ha of wholecrop. There was also 12 hectares of farm woodland.

Because of their participation as a Farming for a Better Climate host Climate Change Focus Farm, it is estimated that through implementation of practical, low or no cost measures John and Anne have **reduced the farm carbon footprint by around 6% and saved £63,000 with no loss of production.**

### Optimising fuel and energy use

With a need to heat water and cool milk at the twice daily milking, dairy units have significant energy demands. Small changes to tasks repeated on a daily basis can give significant annual savings. Fuel for vehicles is also an on going cost, as is lighting in livestock accommodation.

Here are some of the topics discussed at the group events, and where John instigated changes during the programme:

- A larger plate cooler will cool milk faster and more efficiently. John is installing an old bulk tank to pre-cool the water before it enters the plate cooler, with a view to investing in a larger plate cooler in the future.
- Re-using water from the plate cooler as drinking water for the cows. Providing pre-heated drinking water reduces the energy needed to bring that water up to body temperature (37°C). It takes 1.5MJ of energy to heat one litre of water from 0 - 37°C. Cows in peak yield can drink over 100l/ day, so the energy requirement is significant. By using preheated water, energy can be used for production instead of regulating the consumed water temperature.
- Changes to the shed allowed natural light to replace the previous reliance on fluorescent lighting which has saved approx. £103/yr.
- Following an energy and fuel audit, the use of a smaller tractor where practical will reduce fuel usage. By putting the smaller tractor on the diet feeder, John has saved around 4,400 litres of fuel annually. With red diesel at 53ppl, this equated to a saving of £2,330 and 11,792 kg CO<sub>2</sub> per year.



### What have other farmers done?

Find out how other farmers have improved profitability and are adapting to a changing climate in our series of case studies.

We also have a number of Practical Guides - we cover five key topics that could save you money and benefit the farm business:

- Use energy and fuels efficiently
- Renewable energy
- Lock carbon into soils and vegetation
- Optimise nutrient use
- Optimise livestock management

For further tips and ideas, see [www.farmingforabetterclimate.org](http://www.farmingforabetterclimate.org) find us on Facebook or follow us on Twitter @SACFarm4Climate

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# Findings from Woodhead

## Nutrient use efficiency

- Soil sampling identified areas that were impeding and limiting grass and clover growth, such as soil pH and low levels of phosphorous and potassium. Addressing these issues with an annual liming plan and a targeted nutrient budget has improved grassland productivity.
- Grass production has increased following the improvements to soil health, meaning the need to go for a 3<sup>rd</sup> cut of silage was negated. This resulted in a saving of 19.2 tonnes of purchased third cut silage fertiliser (27:14:0) and 418 litres of red diesel, saving of 74,559 kg of CO<sub>2</sub>e (carbon dioxide equivalent) and £5,020.
- In 2016, John and Anne decided to stop growing whole crop. This was replaced by oat, barley and pea arable silage, under sown with grass and clover. The mix includes two legumes which provide sufficient nitrogen for the crop to reach target yield and result in an equivalent saving in nitrogen fertiliser of 0.289t/ha of 34.5N, equating to £356 and 6,490 kg CO<sub>2</sub>e.
- Improvements in grazing and silage ground has allowed John to utilise his paddocks more effectively. This has increased milk from forage over the farm, meaning fewer tonnes of bought in feed were required to achieve the same output.

## Livestock productivity

- Improvements in silage quality from 10.9ME to 11.1 ME (metabolisable energy) (2016) and 11.9 (2017 1<sup>st</sup> cut) resulted in 65 tonnes of straw and 48.6 tonnes of wheat being saved over the 90 autumn block cows. At prices of £130/tonne wheat and £125/tonne straw it would have cost £14,500 to feed the cows to the same level of performance, saving 34,568 kg CO<sub>2</sub>e
- In addition to adaptations to existing calf accommodation, two calf igloos were purchased to provide additional calf rearing capacity. Calf performance improved, allowing John to sell calves for over £200 at 3 weeks old. Calves are reared on whole milk that would ordinarily be discarded from the food chain and have few other costs.
- Calf jackets were introduced as a routine management practice on smaller, weaker calves, resulting in improvements in survival and growth rates.
- Developing a targeted animal health plan with help from SAC Consultants and his practice vet allowed John to reduce the heifer age at calving from 27 to 24 months. Based on feed use only, it is estimated to have cost the business £5,130 to rear these heifers for an extra 3 months, increasing emissions from feed by 21,986 kg CO<sub>2</sub>e; reducing the age of calving has meant this has now been saved.
- John diverted Astroturf destined for landfill and laid it as cow tracks through his fields. This provides a more uniform walking surface for the animals reducing the risk of stone damage to feet and has led to an improvement in lameness. Lameness in dairy cows can have significant impacts on productivity, leading to an increase in the carbon footprint. Better access to paddocks has also helped to improve grazing utilisation.
- One of the most recent changes at Woodhead has been the removal of some of the side sheeting on the cow shed. This has dramatically changed the airflow and light levels in the shed. Following the success of this action, John plans to remove additional sheets and is going to open the ridge of the shed to improve the air stack effect. Increasing light levels for the cows is estimated to give an extra litre per cow per day (28,800 litres per year) equating to increased income of £8,300. In terms of carbon savings, this increased yield across the herd is expected to reduce the future farm carbon footprint by 1.88%



## What were the key findings from Woodhead?

- Significant financial and carbon savings can be achieved through low cost changes to routine tasks.
- Improving grass growth and utilisation can make huge differences to profitability, but don't neglect the basics - soil pH and nutrient levels must be correct and any soil structural or drainage issues addressed.
- Animal health is key to improving livestock productivity; simple records can help identify underlying problem animals which can then be individually targeted to improve whole herd efficiency.
- Measure to manage - A detailed energy audit can highlight areas where improvements in fuel usage can be made which can make substantial savings on the fuel bill and reduce your farm carbon footprint.
- For more information on the efficiency measures undertaken at Woodhead and the other focus farms, visit the Farming For a Better Climate website at [www.farmingforabetterclimate.org](http://www.farmingforabetterclimate.org).