

Thankerton Camp Farm, Biggar, Lanarkshire.

Introduction

Thankerton Camp Farm is a 100ha holding in Lanarkshire, producing beef solely from forage and retailing it directly to the consumer both locally and further afield through the farm's butchers shop and online outlet.

The farm buys in store cattle at 6-12 months of age and finishes 150 Aberdeen Angus cattle per year on a highly productive forage rotation based on high quality leys (66ha), forage brassicas (17ha) and spring cereal and pea wholecrop (17ha). Grass and clover leys are divided into paddocks and managed on a rotational basis, aiming to keep high quality grass in front of the cattle at all times. This is achieved through carefully planning stocking rates and by taking surplus growth as silage cuts. Forage brassicas are strip grazed through the autumn and winter with the cattle given simultaneous access to silage. Wholecrop pea and barley silage is also produced on the farm and is used as a nurse crop for grass and clover leys.

The cattle are finished at 20-28 months, achieving a dead carcass weight between 280 and 350kg at target R4L carcass classification.

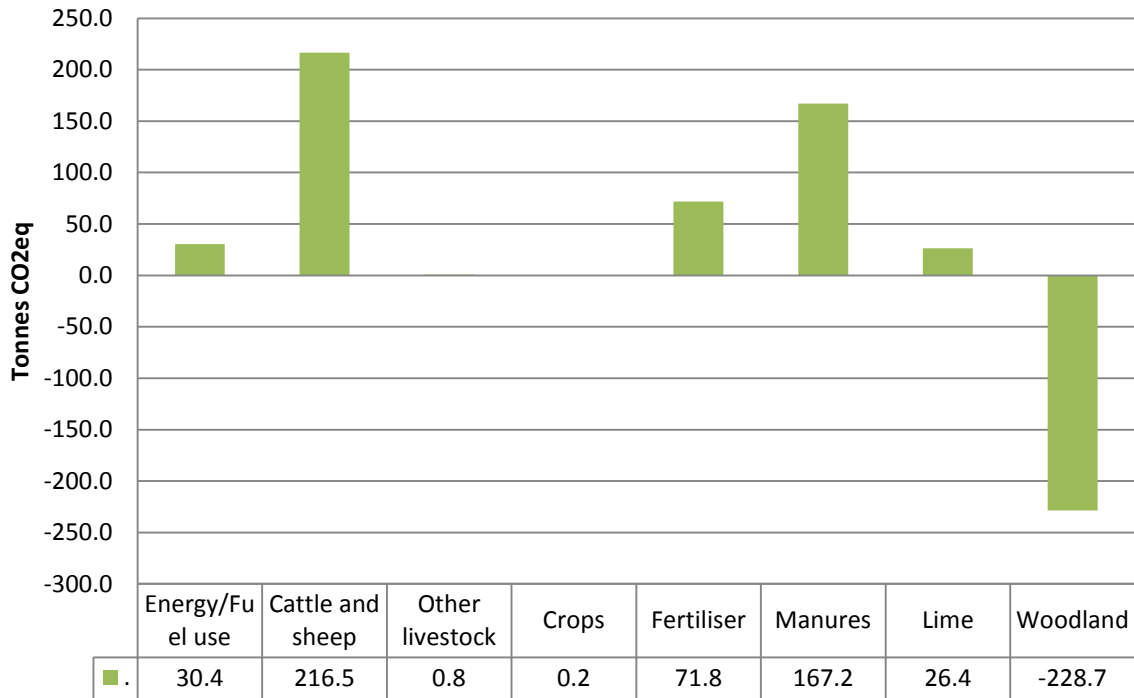
The farm also produces 200 turkeys for the Christmas market.

Carbon footprint

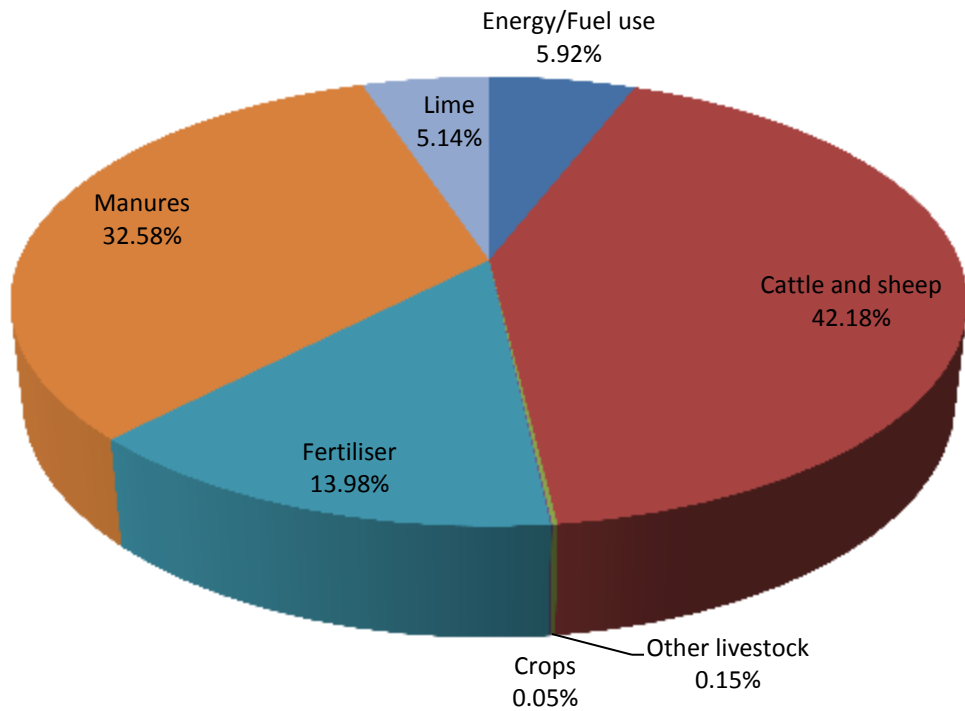
The carbon footprint for Thankerton Camp Farm has been carried out using the CALM calculator which is available to use for free at www.calm.org.uk. The calculator enables farmers to assess the carbon balance of their farm. It produces a 'whole farm' report which indicates the level and type of emissions attributable to different areas of the farm system enabling the user to identify 'hotspot' areas where improvement could be made and quantify the affect that such changes could have on the farm's carbon footprint.

Source	CO2 (kg)	CH4 (kg)	N2O (kg)	Total CO2 eq (tonnes)
Energy/Fuel use	30.4			30.4
Cattle and sheep		9656.0	44.3	216.5
Other livestock		15.6	1.4	0.8
Crops			0.8	0.2
Fertiliser			231.5	71.8
Manures			539.3	167.2
Lime	26400.0			26.4
Woodland	-228738.0			-228.7
TOTAL	202338.0	9671.6	817.3	254.1
Indirect emissions from manufacture of fertiliser	42706.0			42.7

Emissions and sequestration (tonnes CO2eq)



% of emissions from farm sources



Methane from cattle and sheep is released as a result of enteric fermentation. This is a vital part of ruminants' digestive process and can therefore not be eliminated. Management to optimise production will reduce methane as the livestock live and produce more efficiently – ensuring livestock receive a high quality diet, that health and welfare is of a high standard and that fertility is optimised will all contribute to a more efficient system, reducing emissions per kg of output.

In 2009, EBLEX published 'A Change in the Air', the first phase of the English Beef and Sheep Production Roadmap, this was followed by two further reports in 2010 and 2012. EBLEX suggest that achieving optimum daily liveweight gains; achieving best finishing weights as early as possible; feeding a high quality diet; and ensuring a high output per breeding unit will all contribute to creating a low carbon system. They found a positive correlation between gross margin per kg liveweight and carbon emissions – for every 5kg of CO₂ eq reduction they found a 50p per kg increase in margin. Improving efficiency through increased fertility, feed efficiency, and longevity could all contribute to improving emissions while also improving profit margins.

Emissions from imported manure make up 32.6% of Thankerton Camp Farm's carbon footprint. Poultry manure is an important source of fertility for the farm with over 500 tonnes of poultry litter brought in annually to replenish P and K within the soil. To ensure that emissions from the litter are minimised it is important that careful attention is paid to the application rate and timings. Emissions of both nitrous oxide and ammonia as well as nitrate leaching can all be minimised by ensuring that the amount of N applied does not exceed the crops requirement. Soil analysis, soil mineral nitrogen calculations and nutrient budgeting on a field basis will help in ensuring over application is avoided. The timing of the application is also key – the manure should be applied to ensure that nitrogen release coincides with the crop growth and therefore demand. Ploughing in/incorporating the manure within hours of application will also help minimise losses.

Emissions from fertiliser make up 14% of the farm's footprint but also carry indirect emissions from their manufacture (an additional 42.7 tonnes CO₂eq). The total emissions from fertiliser used at Thankerton Camp Farm come to 114.5 tonnes CO₂eq – this equates to 3.5 tonnes CO₂eq per tonne of fertiliser used compared to 0.3 tonnes CO₂eq per tonnes of poultry manure applied. Nitrogen fertilisers contribute a significant amount of nitrous oxide and carbon dioxide to the UK's total emissions as well as having a detrimental effect on the levels of carbon sequestered in the soil. Alternative sources of fertility should be used where ever possible to reduce the reliance on artificial nitrogen.