Teagasc/Irish Farmers Journal

BETTER FARM BEEF CHALLENGE

SUMMER FARM WALKS 2019

IRISH FARMERS JOURNAL farmersjournal.ie

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Wesley Browne
Leagh, Co Monaghan H18R921
Farm walk date and time:
4 July 2pm and 5pm

Harry and Joseph Lalor
Ballacolla, Co Laois R32CX29
Farm walk date and time:
11 July 2pm and 5pm

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04 Wesley Browne

12 Harry and Joseph Lalor

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Adam Woods
Beef editor, Irish Farmers Journal

On behalf of the stakeholders of the Teagasc/*Irish Farmers Journal* BETTER Farm beef challenge, I would like to welcome you to our two summer farm walks. We hope you will find these informative and practical and that you can take home some key messages to improve the profitability of your farm. While increasing output and subsequent gross margin has been a central theme to all farms in the programme, it is the manner in which this higher output is achieved that brings the greatest learnings. All of the programme farms have placed a huge emphasis on grass and growing and utilising as much of it as possible in a bid to reduce costs. These farm walks will look at strategies employed by the farmers in relation to grassland management. Achieving higher animal performance by improving the genetic merit of suckler herds through better breeding has also reaped dividends. Most importantly, I want to thank Wesley and Harry and Joseph and their families for opening up their farms. With the support of Martina Harrington, Tommy Cox and John Greaney, as well as their local Teagasc B&T advisers Conal Murnaghan and Peter Doolan, I have no doubt that these two farms will continue to grow and improve their businesses in the years ahead. Finally, I would like to acknowledge the continued support of the programme sponsors FBD, ABP, Dawn Meats and Kepak.

Martina Harrington
Teagasc/ Irish Farmers Journal BETTER farm beef challenge manager, Teagasc

On behalf of the Teagasc/*Irish Farmers Journal* BETTER Farm beef challenge management team, I would like to welcome you to the farms of Wesley Browne and Joseph and Harry Lalor. It has been a pleasure to work with both farms and I want to thank them and their families for their openness and willingness to work with us over the last two and a half years. I would also like to take this opportunity to thank their local Teagasc B&T advisers Conal Murnaghan and Peter Doolan for their contribution to the programme.

The BETTER Farm beef challenge has been designed specifically to demonstrate how the adoption of key technologies can benefit suckler farms both practically, in the day-to-day running of their farms, and financially. The strength of the programme is that these technologies, such as improved grassland management, soil fertility, breeding and herd health, are being adopted not only on research farms but on commercial family farms.

The purpose of these two farm walks is to demonstrate the positive effect of the changes made by Wesley Browne and Joseph and Harry Lalor to their respective farms. I hope you find the days useful and can identify at least one change that you can bring home to your own farm to benefit you. Thank you for your time, enjoy the walks and take the opportunity to ask questions.

Teagasc/Irish Farmers Journal
BETTER FARM BEEF CHALLENGE

Harry and Joseph Lalor

Welcome to Laois

On behalf of myself and my father Joe, I would like to welcome everyone here today to our farm in Knockmullen, Co Laois. We sincerely hope you have an enjoyable day and find it both informative and worthwhile.

Since joining the Teagasc/*Irish Farmers Journal* BETTER Farm beef challenge in 2017, we have implemented many changes on our farm. The numerous changes to the farm have been focused mainly towards efficiency.

While our beef system has been tweaked slightly, grassland management has been the main area we've focused our attention on.

A paddock system has been developed and our farm is now finally setup to grow and utilise more grass more efficiently. A dairy-calf-to-beef system has also been established and works well alongside the sucklers in spring.

Furthermore, slightly adjusting our finishing system has given us more security by finishing bulls under 16 months within the required specifications.

By making these changes, we have seen our farm's performance improve steadily. In 2018, we were stocked at 2.64LU/ha, a good jump from 2.2LU/ha when we started the programme only a short while ago.

Our output has also climbed significantly. In 2018, it was 1,081kg/ha. Again, that's a good move away from our baseline of 820kg/ha and it brings us closer to our end-of-programme target.

Finally, we would like to give a special thanks to our Teagasc BETTER farm programme adviser John Greaney and our local Teagasc B&T adviser Peter Doolan for their continued advice and support.

We would also like to thank Teagasc and the *Irish Farmers Journal* for allowing us to participate in this programme and acknowledge the industry stakeholders for their continued support.

Teagasc/Irish Farmers Journal
BETTER FARM BEEF CHALLENGE

Harry and Joseph Lalor

An assortment of

Harry Lalor and his father Joe joined the Teagasc/*Irish Farmers Journal* BETTER farm beef challenge in 2017. The primary enterprise is a 100-cow suckler herd where all progeny are brought to finish through an under-16-month bull and 24-month heifer-beef system.

To boost output, a dairy-calf-to-beef system was also introduced in year one of the programme. Harry and Joe also have a mid-season lambing flock of 300 ewes, which fits in well due to roughly 30% of the farm being peaty and heavy in nature – particularly in the shoulders of the year.

A considerable amount of time and money has been invested in grazing infrastructure in recent years, as the Lalors have scaled back on their tillage enterprise.

Their holding is one of the largest in the programme comprising of 121ha, all in the one block. Just over 82ha is afforded to the cattle enterprise, while the sheep and tillage enterprises are allocated 28.5ha and 10ha respectively.

In 2019, 110 cows calved and the target for the future is to have 100 live calves on the ground each year.

The suckler herd comprises of mainly continental-type suckler cows with Salers-Limousin being viewed as an ideal cross.

In recent years, Harry has bred replacements from the dairy herd to introduce more milk into the herd, provided he was happy with their conformation and weight prior to breeding.

Figure 1
Phosphorus (P)

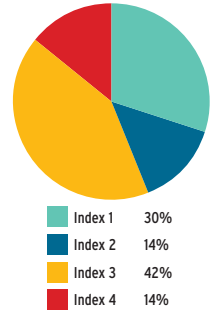
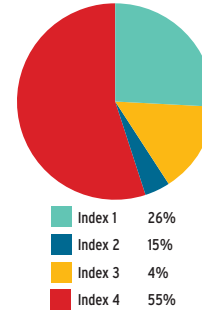


Figure 2
Potassium (K)



Before joining the programme, Harry and Joe operated a 20-month bull-beef system, whereby all males went to grass for a second season. The farm is now weaning a heavier bull calf and, by focusing on better nutrition over the winter period, it has allowed them to slaughter bulls under 16 months of age on the grid.

In 2019, the best of the male progeny on the farm were sold live to boost cash-flow reserves and alleviate worries over fodder.

One-hundred dairy-bred calves were reared this spring on the farm. The plan is to finish the males as bulls at 20 months of age. These bulls will return to grass next spring as yearlings before being housed for a 100-day finishing period in early August. The females will either be kept for breeding or slaughtered off grass under 20 months of age.

systems in Laois

Table 1: The Lalors' farm plan – 2017 to 2021

Measure	Base year 2017	Target 2021
System(s)	Suckler-to-beef	Suckler-to-beef Dairy calf-to-beef
Stocking rate (LU/ha)	2.2	3.05
Land base (ha's)	86	79
Gross output/ha (kg)	820	1359
Gross output/ha (€)	1403	2720
Variable costs (% of output)	68%	50%
Gross margin €/ha	448	1360

Given the scale of the farm and the increasing stocking rate, growing cheap feed in the form of grass is key to keeping concentrate costs at bay.

Soil fertility is hugely influential in determining the level of grass grown on a farm each year. On this farm, soil fertility is impressive (Figures 1 and 2). The pH (lime) status is very good, with 75% of the ground at 6.5, while another 20% is between 6.2 and 6.5. Looking at phosphorous and potassium, this is also strong thanks to Joe's firm belief in spreading compound fertilisers down through the years. However, there is always room for improvement.

Teagasc/Irish Farmers Journal
BETTER FARM BEEF CHALLENGE

Harry and Joseph Lalor

Simple breeding in Ballacolla

This year, 123 females are running with the three stock bulls on the farm. A terminal Charolais bull runs with 40 big-framed cows and a Limousin bull runs with the more maternal-type cows or any cows that may have required assistance at calving. A Salers bull runs with the heifers due to his ease of calving.

Over the last number of years, the calving period has been gradually coming forward. The herd calves in early February, which is two weeks earlier than when the programme started.

The main reason is to take the pressure off labour in the spring by getting more cows calved prior to lambing kicking off around 15 March.

As well as that, Harry's stock bulls are certainly doing the business and their high genetic merit (Table 1) is being reflected in the performance of their progeny.

Looking at last year's slaughter report, bulls had an average carcase weight of 392kg at 18 months and heifers had an average weight of 322kg at 22 months.

While Harry has worked hard to improve the herd's key performance indicators, there is still scope for improvement.

Calving interval stands at 382 days and although it is ahead of the national average, he hopes to reduce this further to 365 days.

Given the size of the herd, there will always be casualties, but his calf/cow/year figure is slightly lower than he would like at 0.86 for 2019.

Table 1: Stock bull information

Bull name	Breed	Sire	Replacement index	Terminal index	Calving difficulty
Ballyricky Mark	CH	Fiston	€51	€153	9.90%
Brookland Gameboy	LIM	Ampertaine Commander	€113	€157	4.10%
Carrentubber Primetime	SA	Vanlooy	€165	€60	1.40%

Calving at 24 months

Harry and Joe have always calved their maiden heifers at 24 months in an effort to make their suckler herd more sustainable by reducing costs and their carbon footprint. Why should we consider calving heifers at 24 months?

➲ Reduced costs – research at Grange shows for a 50-cow herd with a 20% replacement rate, each additional month that calving is delayed costs €490 or €50/heifer per month.

➲ Reduced stocking rate.

➲ Potential to reduce number of stock groups at grass, cutting down on labour.

➲ Greater carbon efficiency.

TOP TIPS

➲ **1. Identify your replacements early:** Harry and Joe monitor all of their potential replacements as calves. By weaning time, they will have identified the best-performing heifers from the best cows that have been sired by bulls possessing good maternal traits. With his dairy-bred calves, frequent weighing is a good indicator of potential high performers.

➲ **2. Feed appropriately over first winter:** The heifers are generally between 280kg and 320kg at weaning, which means that the Lalors will need them gaining a minimum of 60kg to 80kg over their first winter to reach target bulling weight at 15 months. Depending on silage quality, they will need 1kg to 3kg of a good-quality weanling ration per day over winter to achieve 0.6kg gain/day. Table 2 shows some of the key target weights needed for 24-month-old calving.

➲ **3. 60% of mature weight at bulling:** If mature cow weight is 700kg, ideally heifers will need to be around 420kg at bulling. Lighter than this may mean some of the heifers are not cycling at the start of breeding. Heifers that are too light at bulling could also go in calf easily in their first year, but struggle as first-calvers to go back in calf again.

➲ **4. Calving ease of sire used:** Selecting an AI or a stock bull with proven ease of calving is paramount. This farm's Salers bull has a calving difficulty of 1.4%. The target is to get these young heifers calved safely and give them every chance to go back in calf again as first calvers. Ideally, select bulls with a proven calving difficulty of 4% or less.

➲ **5. Pre- and post-calving care:** Once successfully bred, heifers need to be well managed to achieve 80% of their mature weight by calving. If they average at least 0.6kg/day throughout pregnancy, they should achieve this target. The Lalors monitor heifer body condition to ensure they are fit but not fat at calving. The statistics show that we need to be particularly vigilant at calving. Between 50% and 60% of heifers need some level of assistance at calving. Once calved, don't allow heifers to lose condition. A rapid turn-out to grass after calving will help with this. Heifers that remain indoors for a month or more after calving should be supplemented with at least 2kg of concentrate/day on good silage.

Table 2: Weight targets for 24-month calving for a 600kg and 700kg mature cow

Mature cow weight	Weaning weight	Bulling weight	Calving weight
Target % of mature weight		**60%**	**80%**
600kg	260-280	360	480
700kg	300-320	420	560

Harry and Joseph Lalor

Alternative ways to stock up for the winter

Forage crops make up 23% of the total fodder required on the Lalors' farm this winter, while arable silage makes up a further 18%. Therefore, it is vital these crops yield well. To ensure the success of any winter forage crop, there are a number of factors that should be considered prior to sowing, including sowing date, sowing rate, fertiliser requirements and weed control, as well as the cost and expected yield.

Table 1 gives a full breakdown of various winter forage crops and the factors to consider. An utilisation figure of 70% is used here.

However, you may get to utilise more or less, depending grazing management and grazing conditions.

KALE, RAPE AND REDSTART

Sowing:

➲ Early sowing, a fine firm seedbed and moisture are essential for rapid emergence, as they have small seeds with low reserves.

➲ Ploughing and powered cultivation is the surest method of establishment, but in well-structured soils, direct drilling will also be successful. With direct drilling, it is essential to achieve a good weed kill with glyphosate pre-cultivation. Always roll after sowing.

Grazing:

➲ Introduce stock to brassicas gradually (one to two hours/day initially, building to unrestricted access in seven to 10 days).

➲ Strip graze, using an electric fence to

Table 1:

Forage crop	Sowing date	Sowing rate (method)	Fertiliser requirements	Weed control	Feeding period
Kale	Early May to mid-June	4.5kg/ha Direct drill	130kg/ha N 30kg/ha P 170kg/ha K + Boron	Butisan S Pre-em	November to February
Forage rape	Mid-May to mid-August	6.5kg/ha Direct drill	120kg/ha N 20kg/ha P 50kg/ha K + Boron	N/A	October to February
Redstart	June to August	6kg/ha Direct drill	130kg/ha N 30kg/ha P 170kg/ha K + Boron	N/A	October to February
Arable silage	April to May	40kg/ha Peas + 60kg/ha barley or oats + grass	100kg/Ha N 25kg/ha P 85kg/ha K	Pendimethalin pre-emerge of the crop.	Harvested July – August

maximise utilisation.
➲ Each break should be long and narrow to avoid trampling the crop.
➲ Provide supplementary fibre at all times, eg silage, hay or straw.
➲ Try to have bales in the field before grazing to minimise compaction.
➲ Always allow access to a run-back area. Remember to check cross-compliance rules.
➲ Ensure appropriate minerals are available – bolusing animals is the most effective means to achieve this.
➲ Always provide easy access to fresh water.

	Yield potential (utilised)	Cost per ha	Cost / tonne of DM utilised
	5-8t DM/ha	€729	€121
	2.5-4.5t DM/ha	€530	€151
	6-8t DM/ha	€799	€100
	5-7t DM/ha	€852	€142

ARABLE SILAGE

Harvesting:
The crop usually requires a growing period of 12 to 15 weeks to mature. Ideally, the cereal grain should be at the milky to early dough stage of maturity. The bottom pea pods are formed, but not completely swollen and are 3cm to 4cm long. The first flowers are beginning to drop off and other flowers are coming into bloom. An additive may help reduce feeding losses.

Feeding value:
The digestibility of arable silage can be low (60% to 65% DMD), indicating it would not be a suitable energy source for high-producing animals unless supplemented with sufficient energy-rich concentrate. Arable silage is most suited to dry cows and store cattle. Protein content is often quite high, reflecting the impact of the legume.

Preservation:
Can be tricky because of the low DM, low sugar content and high buffering capacity (impact of the legume). Ideally, a crop such as this would be harvested on a very dry day and would receive an effective wilt or a higher rate of preservative.

Teagasc/Irish Farmers Journal
BETTER FARM BEEF CHALLENGE

LIFE beef carbon

BY JONATHAN HERRON AND DONAL O'BRIEN
ANIMAL & GRASSLAND, RESEARCH AND INNOVATION CENTRE, TEAGASC, MOOREPARK, FERMOY, CO CORK

Beef production systems emit significant volumes of carbon as methane and carbon dioxide gas and lose nitrogen as nitrous oxide gas. These gaseous emissions trap heat in our atmosphere like glass panes in a greenhouse and are collectively known as greenhouse gas (GHG) or carbon emissions.

Over the last 50 years, there has been a large increase in the volume of carbon in the atmosphere and there is concern that this is changing the climate and adversely affecting the economy and environment.

In line with other EU member states, Ireland has agreed to reduce carbon emissions by 30% compared with 2005 levels by 2030.

As the agriculture sector is the primary source of GHG emissions in Ireland, it is at the forefront of the emissions challenge. Additionally, the sector is facing challenging food demands from the world's growing population and therefore needs to develop solutions to reduce GHG emissions per unit of beef, ie carbon footprint of beef.

However, cutting beef's carbon footprint is difficult, as the majority of emissions (90%) are generated from biological farming sources, ie soils and animals. Nevertheless, it is possible in three ways – improving efficiencies, using low-emission technology and building soil carbon.

The goal of LIFE beef carbon is to reduce the carbon footprint of beef farms by 15% over a 10-year period – the equivalent of 120,000t of carbon dioxide equivalent (CO_2e) in four partner countries – Ireland, Italy, Spain and France.

It aims to reduce carbon emissions by demonstrating systems and practices that simultaneously enhance farm profitability and reduce the beef carbon footprint, thus enhancing the overall sustainability of the farming system. A total of 2,000 demonstrative beef farms, including 100 Irish farms, will have a carbon assessment conducted.

Currently, carbon action plans are being tested in each partner country. The action plans contain a range of practices and technologies recommended for reducing beef farms' GHG emissions.

Across the four nations, a network of 172 innovative farms are being used to evaluate measures planned to reduce GHG emissions and increase carbon storage.

In Ireland, 20 farms from phase three of the Teagasc/*Irish Farmers Journal* BETTER farm beef challenge have been selected as the Irish innovative farms. Practices that have been included in the Irish action plans are primarily focused on the following:

- Improve animal health and forage quality.
- Optimise calving rate and age at first calving.
- Increase genetic merit and optimise finishing age.

➲ Enhance soil fertility and soil carbon.
➲ Increase grass yield and utilisation.
➲ Using low-emission technology (eg slurry application, protected fertiliser).

The feasibility of carbon footprint-reducing practices will be determined based on their effectiveness in reducing GHG emissions, enhancing overall sustainability of the innovative farms and the practicality of applying the practice. When feasible measures are identified, a final action plan will be developed to provide a road map to reduce GHG emissions from the Irish beef sector.

Production data from 2016, prior to the farms entering the BETTER farm beef challenge, was used to calculate the baseline carbon footprint. The beef carbon footprint is expressed on a per-kilogramme-of-liveweight-gained-basis. Figures 1 and 2 outline the average baseline carbon footprint and emission profile of the 20 Irish farms.

Methane belched from the digestive system of cattle was the main GHG contributing to the carbon footprint of beef (Figure 1) and was the main source of GHG emissions from the innovative farms (Figure 2). Nitrous oxide emissions from fertiliser application, manure excreted during grazing and manure management were the next most important contributors, followed by CO2 emissions from concentrate feed, fertiliser production and electricity and fossil fuel burning. See pages 22 and 23 for a snapshot of Wesley Browne's and the Lalors' beef carbon footprint.

Figure 1
Carbon footprint

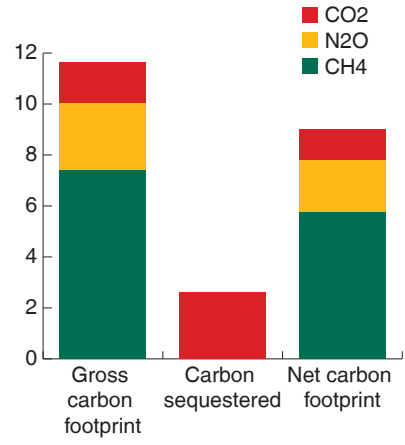
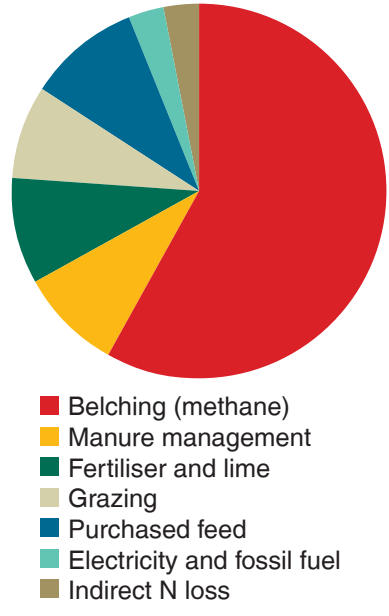
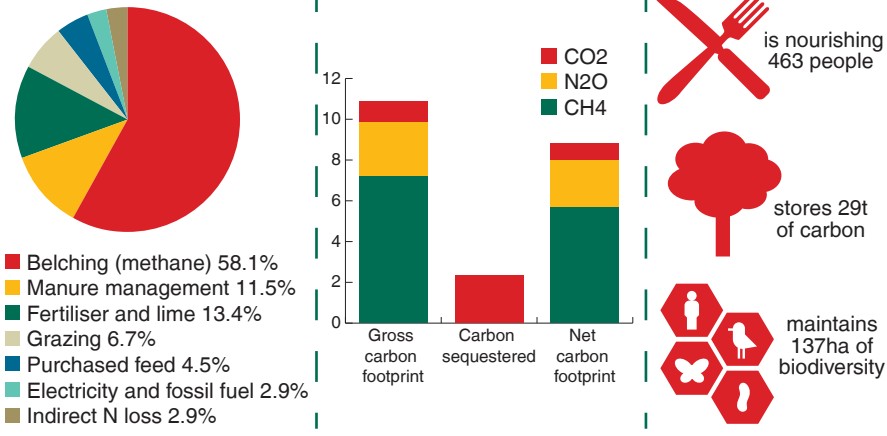


Figure 2
Emission profile



BEEF CARBON FOOTPRINT

Wesley Browne



Wesley Brown's farm is fragmented into a number of blocks, with the majority on heavy drumlin-type soil. To maximise grass in the diet, quality and digestibility, as well as grass utilisation in the shoulders of the year without damaging fields, Wesley has adopted zero grazing. Although zero grazing will increase emissions relative to grazed pastures, it may generate fewer emissions than grass silage due to the higher digestibility of freshly cut grass.

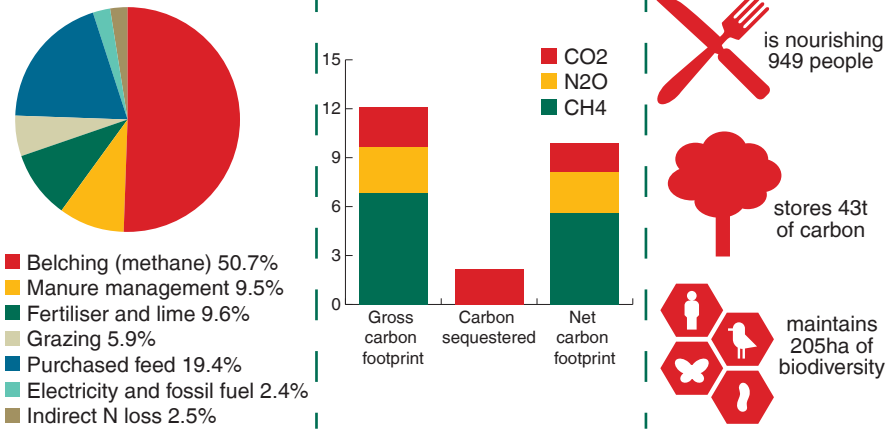
On pages 10 and 11, we see Wesley is trying to increase the volume of grass grown by improving soil fertility and grazing infrastructure. This increase from improved grassland management will improve the farm's response to N fertiliser and reduce carbon and ammonia losses.

Wesley has a dribble bar slurry spreader in his yard. Any low emission slurry spreading technique reduces NH3 emissions by reducing the surface area of slurry exposed air. A trailing shoe is perhaps even more effective at reducing NH3 emissions as it places the slurry directly on the soil beneath the sward. A shift of slurry application to spring, combined with good practice and use of low emission slurry spreading techniques, will reduce NH3 emissions from land spreading. In turn, by reducing N losses from land spreading, these application techniques increase the N fertiliser replacement value (three units N per 1,000 gallons), thus reducing total fertiliser N inputs and associated N soil emissions.

Protected urea is a new option to improve the nitrogen use efficiency of farms and reduce carbon footprints. If not applied in correct conditions up to 15% of N in unprotected urea can be lost as NH3. Protected urea is coated by a product called NBPT that delays NH3 emissions, allowing the urea to be converted to plant-available N. Protected urea has been reported to emit 79% less NH3 emissions than unprotected urea. CAN has been found to have the highest and most variable GHG emissions of fertilisers. By substituting CAN with protected urea, N2O emissions will reduce by ~70% per unit N, thereby improving nitrogen use efficiency and reducing the carbon footprint of beef from farms.

BEEF CARBON FOOTPRINT

Harry and Joseph Lalor



Harry and Joe Lalor's farm is mainly on free-draining soil, with some parts variable with some heavy peaty gleys. In turn this gives scope for the Lalors to extend their grazing season which will reduce beef carbon footprint by 0.09% per kg beef carcase per additional day at grass.

A longer grazing season increases the proportion of grazed grass in the diet and reduces the proportion of grass silage, thereby improving the quality and digestibility of the feed in the diet. By improving the digestibility and quality of the diet, the proportion of dietary energy lost as methane is reduced due to an increased proportion of leaf at the expense of stem and dead material in the high-quality sward.

Although nitrogen emissions during grazing will increase with the extension of the grazing season, the combination of reduced emissions from manure storage and application, lower methane emissions due to a higher digestible diet and reduced fuel emissions from silage handling and harvesting will reduce the Lalors' beef carbon footprint.

Herd health needed to be addressed. Implementing a herd health plan will allow more animals reach their potential, thus optimising animal performance, increasing overall beef production. If a plan is not in place, sicknesses can increase the carbon footprint. In addition, the Lalors have chosen the breeding challenge as one of their programme options. By increasing the replacement value of the herd and reaching fertility targets, the Lalors' beef carbon footprint will reduce by 0.81kg CO2e/€ index increase/cow. Reductions were mainly driven by the increase in animal performance through improved calf health and calves per cow/year, as well as the reduction in unproductive animals through improved survivability, shorter calving intervals and younger age at first calving.

The size of the holding plus the free-draining soil gives the Lalors' scope to increase farm stocking rate. Dairy calves have been purchased from nearby dairy farms as a means to increase farm productivity. Although they are less efficient in gaining weight than suckler animals, purchased dairy calves have potential to reduce the Lalors' beef carbon footprint.

As there are no cows directly rearing these dairy calves, there are no cow emissions embodied in beef produced by dairy calves, thus resulting in lower GHG emissions per unit output than suckler animals.

Everybody's responsibility

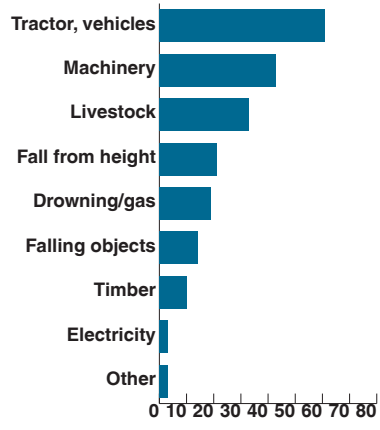
The fatality rate in agriculture in Ireland is, unfortunately, far higher than any other economic sector. Worryingly, the level of farm accidents is not decreasing either. Similar accidents occur each year, with research showing that, in general, farmers' attitudes to safety will only change after serious injury occurs.

In the last 10 years (2009-2018), 207 people have died in agriculture and forestry-related accidents. The main causes of these deaths are seen in Figure 1. The most vulnerable to death and injury on Irish farms are both children and the older farmer (>65 years of age), accounting for almost half of the total number of fatalities.

FARM SAFETY CHALLENGE

The farm safety challenge is a mandatory challenge, with all farmers required to complete a farm safety risk assessment on an annual basis and update this on a yearly basis, and to introduce two positive changes to their farms annually.

Figure 1
The main causes of farm accidents in the last 10 years



As part of the farm safety challenge, participants will also attend safety training days every year during the programme in areas such as livestock handling and machinery safety.