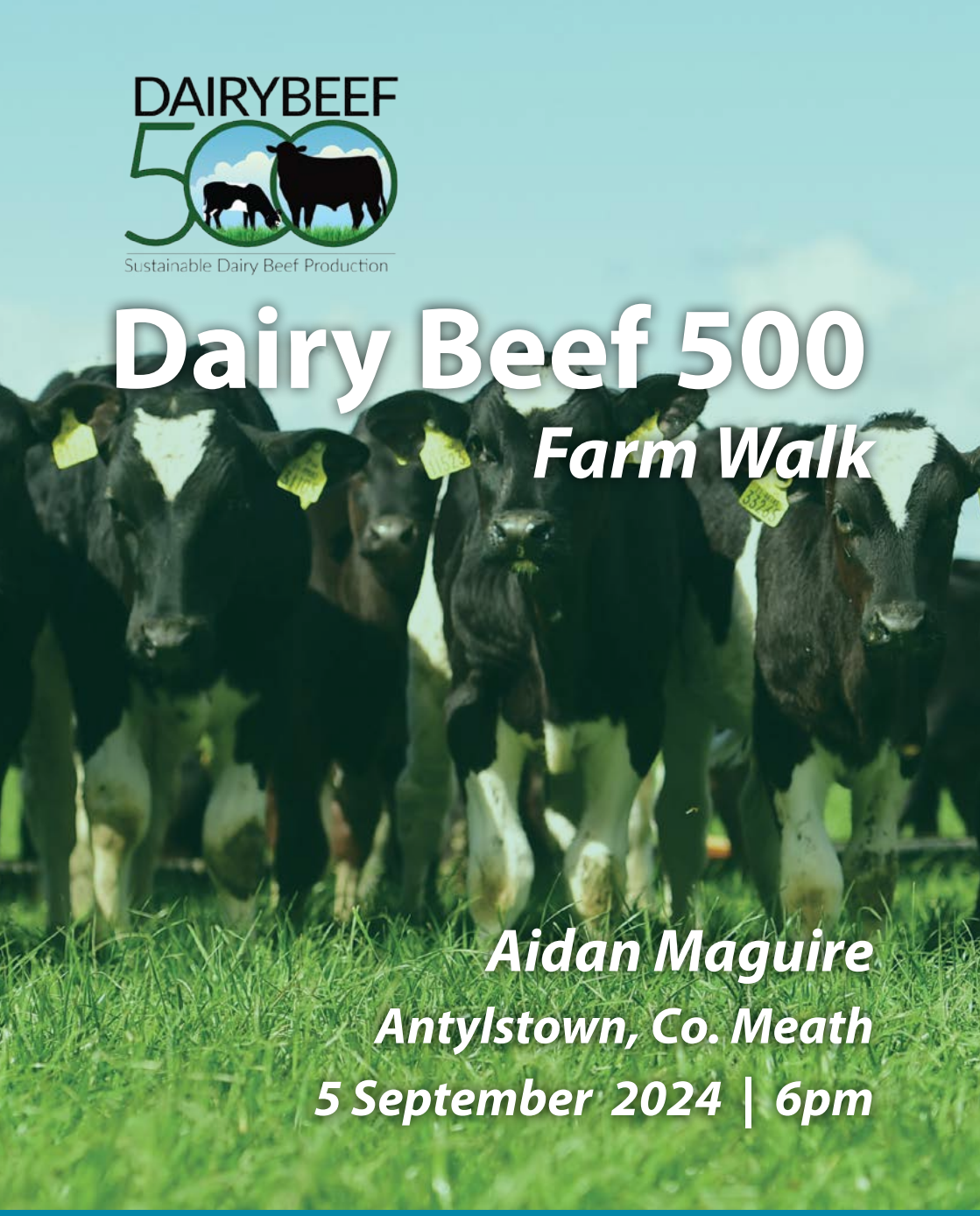
DAIRYBEEF 500

Sustainable Dairy Beef Production

Dairy Beef 500

Farm Walk



Aidan Maguire

Antylstown, Co. Meath

5 September 2024 | 6pm

teagasc

Agriculture and Food Development Authority

SIGNPOST

Farmers for Climate Action

DairyBeef500 Programme

Sustainable Dairy Beef Production

The DairyBeef500 Demonstration Farmers are sponsored by:

Tipperary Dairy Calf to Beef demonstration farm is sponsored by:

For more information please visit: www.teagasc.ie/dairybeef500

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Sponsors welcome

Una Hickey

Welcome from Industry Stakeholders - Volac Milk Replacers Ireland Ltd

On behalf of all the industry stakeholders I would like to welcome you to this DairyBeef 500 Programme demonstration farm walk and live forum on the farm of Aidan Maguire. We are delighted to be involved with Teagasc as industry partners in the Signpost and DairyBeef 500 Programmes.

The funding of this programme by all involved shows a commitment to the beef sector by supporting a programme where the primary objective is to demonstrate a sustainable dairy calf to beef systems that will return a worthwhile margin to beef farmers while also helping to reduce the environmental footprint of Dairy- Beef production.

We hope that the success and knowledge gained from the previous Green Acres Calf to Beef Programmes in terms of calf rearing, animal health and grassland management can support the current participants in producing more environmentally conscious and financially sustainable dairy-beef systems.

We wish all the participants every success for the duration of the programme.

Sponsors note

MSD

MSD Animal Health is one of Irelands leading suppliers of animal health and technology products to veterinary practitioners and farmers. MSD employs approximately 2800 people across its sites in Ireland, which encompass manufacturing, R&D, commercial and marketing facilities in addition to global support services

Munster Bovine

Munster Bovine is Ireland's market leader in cattle breeding and herd management services. The Munster Bovine technician service is recognized as the leader in its field with over 70 years' experience of carrying out artificial insemination in the Munster and Galway areas. With access to the best genetics, today we offer a complete and integrated range of breeding, milk recording, fertility and performance enhancing services

Drummonds

Drummonds is a leading supplier of agricultural inputs and animal feeds across the North East of Ireland. Annually at harvest the business processes more than 100,000 tonnes of native grain across nine locations, with manufacturing facilities for seeds and animal feeds in Drogheda and Navan. Drummonds is a trusted provider of essential supplies to the farming community.

Liffey Mills

Liffey Mills; Backing those who feed our nation. We work closely with our 10,000 customers to ensure a bright & sustainable future for generations to come in all aspects of agriculture including Dairy, Beef, Sheep & Tillage.

Volac Milk Replacers Ireland Ltd

Volac Milk Replacers Ireland Ltd manufacture and supply high-quality unique milk replacers for youngstock, contributing to sustainable farming practices. Helping our farmers to rear efficient youngstock, protect the future of their herd and increase the profitability of their business.

Corteva

Corteva Agriscience™ is the only major agriscience company completely dedicated to agriculture. By combining the strengths of DuPont Pioneer, DuPont Crop Protection and Dow AgroSciences, we've harnessed agriculture's brightest minds and expertise gained over two centuries of scientific achievement.

Welcome

Alan Dillon, DairyBeef 500 Campaign Manager

On behalf of Teagasc and all the sponsors of the Teagasc DairyBeef 500 Campaign, I would sincerely like to welcome you to our autumn farm walk and forum as part of our 2024 DairyBeef500 farm walk series. I would like to express our gratitude to Aidan and his family for accommodating us to showcase what has been achieved in recent years through their involvement in the Teagasc Green Acres Dairy Calf to Beef Programme and now the DairyBeef 500 campaign.

Aidan has been to the forefront of our calf to beef programmes for a number of years and has shown a deep passion for beef farming over the years. He has demonstrated his open mindedness and ambition to improve profitability of their farms through implementation of technologies to reduce inputs and age of slaughter while maintaining carcass output on the farm.

Aidan has recently begun to use some higher quality beef sires, identified from the recently launched Commercial Beef Value (CBV), a tool which will bring more confidence to beef farmers that they can source calves that are of superior genetic merit in terms of carcass weight and conformation than the average dairy beef calf.

I wish to acknowledge the continued support of our programme sponsors: Munster Bovine, Volac Milk Replacers Ireland Ltd, Corteva Agriscience, MSD, Liffey Mills and Drummonds.

Farmer welcome – Aidan Maguire

On behalf of the Maguire family, I would like to welcome you all here to our farm today. Since joining the Teagasc Dairybeef 500 campaign, the farm has undergone changes which have had a positive impact on both the profitability and productivity of the dairy calf to beef system. All of which will be discussed on the farm here today.

The single biggest improvement I made on farm was to actually measure the grass. To me, it feels like I'm actually counting my money. When the grass is growing well, my business is growing well. Grass is the cheapest and best quality feed that I can give my cattle, so getting as much good quality grass into their diet as possible allows me to reduce the concentrate that I have to feed while at the same time improving animal performance.

Another key area that I believe has really transformed the farm has been better utilisation of the grass grown on this farm. Even with the challenging spring I was able to get yearlings out during breaks in the weather as the grazing infrastructure on the farm allowed for this to happen without any significant poaching. Three years ago I redesigned my paddock system, in order to reduce the residency period in each paddock and while doing this I incorporated a second grass roadway through the farm, both of these investments have really driven on the amount of grass that we can utilise on the farm.

The incorporation of red and white clover has led to a reduction in nitrogen fertiliser used and the Red Clover silage fed to cattle has improved weight gain over the winter. The majority of chemical N that is used on this farm is protected Urea and I definitely see no drop in grass growth by switching from CAN to protected Urea.

Being part of the DairyBeef 500 program has also helped me to improve the genetics coming onto the farm, implement a health plan that ensures a healthy herd that can perform at the level I require and focus on the farm being environmentally sustainable which is important in these changing times.

Finally, we would like to thank both Teagasc and the industry stakeholders for their continued support of the programme.

DairyBeef 500 Campaign Introduction

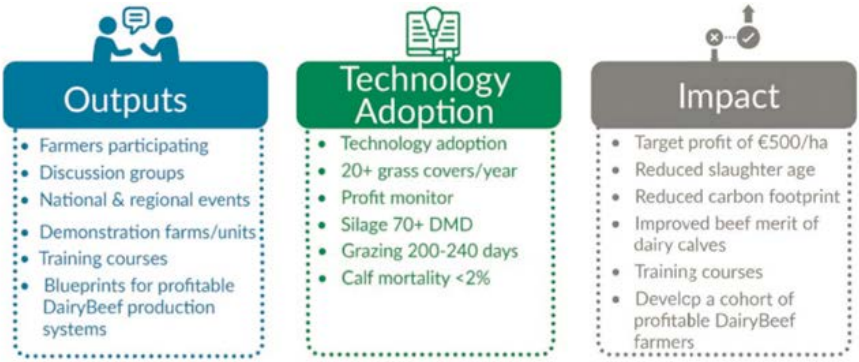
Teagasc has developed an initiative which focuses on management practices for technically-efficient, dairy-beef systems called DairyBeef 500. The campaign will promote the adoption of technologies identified through research onto commercial farms, while monitoring their impact on farm sustainability.

Programme aims:

- Target a net margin of €500 per hectare, excluding land and family labour.
- Increase the adoption of best practices, especially in relation to grassland management and calf rearing.
- Reduce the environmental footprint of dairy-beef production.
- Establish a cohort of profitable dairy-beef producers.
- Create greater integration between the beef and dairy industries.
- Improve the beef merit of calves coming from the dairy herd.

Key performance indicators

The key performance indicators of the DairyBeef 500 Campaign are across three levels.



Demonstration farms

The 15 commercially-operated demonstration farms enrolled will be a key pillar of the DairyBeef 500 Campaign. The demonstration farms will illustrate key technologies including: calf rearing; grassland management; calf health; nutrition; financial management; animal health and welfare; environmental sustainability; and the appropriate use of dairy-beef genetics.

In addition, the Tipperary dairy calf-to-beef demonstration farm will demonstrate the deployment of best technologies in sustainable beef production. A joint venture between Teagasc, Dawn Meats and Shinagh Estates Ltd, the farm will be stocked initially with 300 calves, sired by a range of dairy and beef bulls, which will be reared through to beef as steers and heifers.

Farm Overview – Aidan Maguire

Located in Antylstown, Navan, Co. Meath, Aidan Maguire's farm stretches across 70ha, with the land broken into three blocks, 54 hectares are in grassland and the remainder are in forestry. In recent years Aidan has entered into a registered farm partnership with his son Luke who recently qualified from Ballyhaise Agricultural College.

Aidan and Luke run a dairy calf-to-beef enterprise on their holding in conjunction with a contracting business. Prior to rearing and selling dairy calves, Aidan operated a tillage enterprise along with keeping a herd of suckler cows. However, in 1999, due to a heavy workload with low returns, he decided to cut back on cow numbers, quit tillage and operate a calf-to-store enterprise.

Before Aidan entered the previous Teagasc Calf to Beef Programme, between 100 and 110 Aberdeen Angus, Hereford and Friesian calves were be purchased each year. These calves were mainly sourced from marts and agents with the calves were kept on the farm until they reached 4-500 kg liveweight at approximately two years of age and then all the cattle were sold as forward stores.

Since joining the Teagasc calf to beef programme the Maguire's source all their calves from four local dairy farmers and finishing their heifers at around 21 months and bullocks at less than 24 months of age. The target for heifers are to be over 550 kg livewight at the end of the finishing period and for bullocks to be 600 kg

which leaving a carcass weight of 270 kg for his heifers and 300 kg for his bullocks. Calf numbers purchased annually have also increased with 170 calves purchased for this season.

Even though the numbers of calves on the farm have increased there has been no increase in health issues associated with the rearing of these extra calves. Aidan and Luke maintain that buying calves from local farmers has been key to reducing the amount of health issues on the farm. Aidan is also very fussy when it comes to the age of calf he buys "I will not buy a calf that is less than three weeks of age and even at that if the calf looks thin or anyway off form I will not take him. This means that the calf is over the danger period for Rotavirus and Coronavirus scour and if he does get a touch of crypto scour he is strong enough to overcome it". A vaccination plan also plays a key role in reducing the amount of pneumonia that occurs on the farm

Last year the farm grew over 13 ton/DM of grass per hectare on less than 150 kg of chemical Nitrogen per hectare. The low level of chemical N used on the grassland block is attributed to the introduction of both Red and White clover on the farm. Aidan believes that the application of chemical N on the farm will reduce even further as more clover becomes established. In spring 2022 a Red clover silage sward was established and this block received no chemical N only the three bags of 10-10-20 that was applied at sowing. In 2023 this Red clover sward was cut four times and yielded 28 bales to the acre and tested no less than73% DMD with a crude protein of 14.4 % only receiving cattle slurry after each application.

In 2021 Aidan won Dry stock Grassland Farmer of the Year, having an excellent paddock system, new central (grass) roadway, and measuring has increased grass grown and eaten on his farm whilst reducing the amount of fertiliser spread. Aidan is a big advocate of measuring grass and uploading the figures on Pasture base, last year Aidan uploaded over 40 walks onto Pasture base. He believes that measuring grass is one of the keys to him achieving impressive weight gains at grass.

Going forward Aidan is going to place more emphasis on buying calves from local farmers that on average have better beef genetics. He has a target that purchased dairy bred calves will have a Commercial Beef Value (CBV) of no less than €0 and his beef bred calves will have a CBV of no less than €100.

Farm physical and financial performance – Aidan Maguire

Measure	2020	2021	2022	2023	Aidan's Farm
Physical					
Land base (adj. ha)	46.9	46.4	46.9	46.9	46.9
Grassland Stocking rate (LU/ha)	2.42	2.79	2.72	2.75	2.75
Liveweight output (kg/ha)	1496	1555	1671	1711	
Financial					
Gross output (€/ha)	2807	2876	4358	3658	171560
Variable costs (€/ha)	1205	1404	2127	1954	91642
Variable costs (% of gross output)	43	48	48	53	53
Gross margin (€/ha)	1603	1472	2231	1704	79917
Fixed costs (€/ha)	641	722	981	969	45446
Net margin (€/ha)(excluding subsidies)	1032	750	1250	736	34518

In the last four years Aidan's profitability peaked in 2022, this was mainly due to high output on the farm rather than a reduction in costs. Gross output reduced in 2023 but this stems from poor weight gain in cattle throughout that year due to challenging weather conditions.

Aidan has managed to increase his output from forage in the form of both grazed grass and grass silage. While variable costs have increased over the years, this is mainly due to price inflation and is running at 53% of gross output in 2023, this is the ratio of variable costs to gross output that we would like to see on calf to beef farms.

Aidan runs a high stocking rate on his farm and is currently stocked at the upper end of derogation. Aidan took on more land in the spring of 2024 to reduce his stocking rate and bring the farm below the new nitrates upper limit of 220 kg of N per hectare.

Liveweight output per hectare is high on this farm and this is as a result of good animal performance and a high stocking rate however going into the future annual grass growth will need to remain high in order to sustain the current net margin. Too often variable costs can rise significantly when stocking rate goes up as a consequent of buying in feed from outside the farm to support the high stocking rate.

On this farm, fixed costs have risen by 51% since 2021. The main cause of the rise in fixed costs would have come from machinery running and repairs and maintenance. With more investment on this farm planned in the future we would expect fixed costs to remain at around €1000 per hectare.

All in all this farm is operating at a high level of performance and the financials support this. Gross output is high and there is good control of the variable costs however fixed costs need to be monitored that they do not go too high and enough grass needs to be grown to match the stocking rate otherwise the danger is expensive feed from outside the farm is bought in.

Successful integration between dairy and beef farmers

Annually Aidan purchases approximately 170 calves between the autumn and the spring, mortality is low at 2 % and Aidan maintains that the main reason for this is that he is very fussy when purchasing calves.

Currently Aidan purchases all his calves off five local dairy farmers, over the years he has weeded out the farms that he had felt their calves had more health issues than he liked. All the current dairy farms that he deals with, knows that he will not buy a calf that is less than three weeks of age and even at that if the calf looks thin or anyway off form Aidan will not take him. Often the fear for dairy farmers is that beef farmers will let calves built up on the dairy farm until there is enough calves to fill a trailer, resulting in calves that are fit for sale being held on the dairy farm for an extra week or two than they should be. However Aidan reckons that good collaboration works both ways as dairy farmers need to move calves on quickly during the busy spring, so Aidan will often come and collect calves two or three times a week off the same farmer once they turn three weeks. There is also a cost to feeding these calves for longer and Aidan feels that if you start taking the biscuit in terms of leaving calves longer on the dairy farms, the trust between both farms will end up breaking down.

The main reason Aidan is adamant about a calf being at least three weeks before he comes onto his farm is that the calf is over the danger period for Rotavirus and Coronavirus scour and if he does get a touch of crypto scour he is strong enough to overcome it. All calves are dosed for Coccidiosis on the trailer and are feed that evening with 3 litres of milk mixed up with 450g of milk powder. For the first three or four days on farm they get 500g of milk replacer once a day and this is reduced down to 450 g of milk replacer once a day till the calf is about 65 days old. Two days after the calf arrives on the farm he will get vaccinated for pneumonia and will get an IBR vaccine intranasal, the booster for pneumonia will be administered a month later.

While sourcing a healthy animal is a fundamental aspect of a successful dairy-calf-beef enterprise, just as crucial an area is sourcing a calf that has the genetic potential to perform well from birth right through to slaughter. Aidan is a big believer in the old saying ‘ounce of breeding is worth a ton

of feeding' so going forward Aidan is going to place a lot more emphasis on selecting calves from farms that are producing calves that have on average have genetics that indicate calves that have good beefing traits..

The recent introduction of the Commercial Beef Value, or CBV, provides beef farmers like Aidan with important information about an animal's profit potential. The CBV is an index that includes the genetic potential of beef traits that influence the overall farm performance. Similar to the EBI and Euro-Star Indexes, CBV is depicted as a €uro value. A higher euro value signifies superior genetic merit across all considered traits. CBV values by breed are presented in Table 1. Herd owners can find their CBV on their HerdPlus Profiles. Genotyped animals being traded through marts will also have their CBV displayed on mart boards, providing more information and confidence to potential buyers.

2024 Born beef calves from the dairy herd					
Sire Breed	**Btm 20%**	**Btm 40%**	**Average**	**Top 40%**	**Top 20%**
Angus	<€50	<€72	<€79	>€86	>€104
Aubrac	<€111	<€127	<€34	>€142	>€162
Belgian Blue	<€123	<€140	<€148	>€156	>€177
Charolais	<€132	<€156	<€165	>€174	>€197
Holstein Friesian	<€-18	<€-4	<€2	>€8	>€21
Hereford	<€50	<€67	<€74	>€82	>€103
Limousin	<€133	<€149	<€156	>€164	>€186
Simmental	<€67	<€87	<€96	>€107	>€130

Calf purchasing specifications

Aidan will continue to purchase calves that are at least three weeks of age that come off local dairy farmers however he is going to place a lot more emphasis on the CBV when sourcing stock. All the beef x dairy calves will have to have a high beef genetic merit and be ranked in the top 40% on CBV, which means Angus and Herford calves will have a CBV greater than €80. Aidan will continue to purchase Friesian bull calves as he still feels their value for money however he plans that the Friesian bull calves that he purchases will have a CBV greater than €1.

Grassland management and Infrastructure

Aidan Maguires grassland management is at a very high level and is one area he would attribute to having the biggest influence on profitability on his farm.

Aidan uses PastureBase Ireland and measures regularly on the system using a grasshopper and uploads data, which he uses to make his decisions on grassland management weekly.

Aidan runs a very high stocking rate meaning he has to ensure there is adequate grass of a high quality available at all times and any fall back in terms of forage production will have to be made up in concentrate purchases, which will come at an extra cost.

In 2023 Aidan grew 13 tonne of grass on a dry matter basis using 158 units of nitrogen, 18 units of P and 113 units of K along with cattle slurry. The farm did have to purchase silage in the form of bales last year and possibly will have to this year too.

Due to poorer grass growth in 2024 Aidan has grown 7 tonne up to August 1st and will spread more chemical fertilizer also with 142 units of N, 17 units of P and 105 units of K up to August 1st. This figure will increase as the season progresses.

Aidan has an excellent paddocking system in the farm with roadways allowing easy access to each paddock and makes moving stock a one-man job.

Table 1. Aidan Maguire Grass growth vs Chemical N, P&K usage

Year	Annual Tonnage Tonne/dm/ha	Chem N usage units/acre	Chem P usage units/acre	Chem K usage units/acre
2023	12.9 tonne	158	18	123
2022	10.0 tonne	118	9	48
2021	13.1 tonne	213	27	262
2020	11.7 tonne	151	20	90
Average	11.3 tonne	160	18.5	131

Importance of early turnout

While the last 2 springs have been too wet to achieve full early turnout, Aidan has managed to turnout stock by day on his farm in the spring for periods through the use of roadways.

Spring grass is highly digestible, high in protein and DM content and will support higher animal performance, with each kg DM having 1.03 UFV. Dairy-calf-beef systems must be focused on utilising early spring grass, to achieve higher animal performance and displace concentrate use. Calf-to-beef systems are in a good position to start grazing early in the spring as yearlings are relatively light (300-330 kg) minimising sward damage and they will have a low grass DM demand initially. Aside from direct animal benefits, swards grazed in spring (February-early April) have higher growth rates throughout the year compared to swards ungrazed during this period. Previous research comparing early versus late turnout to pasture in spring, found that swards grazed in February subsequently grew more grass in the second rotation compared to ungrazed swards (90 vs 82 kg DM/ha/day, respectively). Most beef farms in Ireland are finishing the first rotation too late and are losing out on the benefits of early spring grass. If calf-to-beef farms don't start grazing early in the spring this is likely to occur as grass demand will be low, pushing out the start of the second rotation, this will also be compounded by higher production costs during the early half of the spring.

Mid-season grazing management

The main challenge mid-season is to maintain sward quality as grass goes through the reproductive growth stage. Aidan's weekly farm cover measurement is critical at this point as grass growth is high requiring a rotation length of 18 to 21 days and maintaining pre-grazing covers of 1300 to 1600 kg DM/ha and a post-grazing height of 4 to 4.5 cm. From grass budgeting farmers can identify when growth will exceed demand requiring paddocks to be skipped and removed as high quality baled silage. Once Aidan identifies these paddocks, exceeding target-grazing yield he mows and bales as early as possible and not allowed bulk up as this will reduce their regrowth capacity, creating the risk of a grass deficit occurring later. Calves should have access to leafy swards throughout the grazing season, after-grass will satisfy this but when that becomes too strong.

Autumn Management

Planning for spring begins the previous autumn as the majority of grass available for early grazing has been grown over the autumn/winter months. The feed value of autumn grass is less than that of spring grass so there are many advantages to preserving its supply for the following spring when higher levels of animal performance are achievable. To do this farms have to start building farm cover by slowing down the grazing rotation from August 10th, extending it by 10 days/month until mid-October when rotation length reaches 45 days. This will mean grazing pre-grazing covers of 2000 to 2300 kg DM/ha.

Grass has to be budgeted over the autumn to allow animals remain outdoors until mid-November. The 'Autumn 60:40 planner' is a simple tool used to manage grass supply, outlining the farm area which needs to be closed by set dates to ensure sufficient supply in spring, whilst allowing animals graze late into the autumn. The general rule of thumb is to start closing paddocks between October 5th and 10th, and have 60% grazed by November 7th and 100% grazed by December 1st. On heavier soils these dates can be at least 2 weeks earlier. Research has shown that every day delay in closing after October 10th spring-grass supply is reduced by 15 kg DM/ha. At housing the average farm cover should be in the region of 500 to 600 kg DM/ha.

Aidan has an increasing grass demand as the autumn approaches as stock are heavier and will eat more grass. This means Aidan has to have a bank of grass built up into the autumn to hold stock at grass, supplement with meal to reduce demand or house more forward stock for finishing. This will also take pressure off housing and slurry storage facilities as in a 21-24 month system a large proportion of cattle will be slaughtered by the time weanlings are housed.

Red clover swards working well on Aidan Maguire's farm

Currently there are over 20 acres of red clover swards on the farm of Aidan Maguire. Having introduced red clover to the farm over four years ago, Aidan is very happy will its performance to date.

The red clover is sown as part of a full grass sward reseed, with the seed mix contains eight kgs of perennial ryegrass, four kgs red clover and two kgs of white clover seed. Predominantly each year, reseeding is completed in the spring/early summer period. Following cultivation with a disc harrow or power harrow the full reseed mix is sown with an air seeder. Prior to sowing the ground also receives two ton of lime and three bags of 10/10/20 per acre to aid establishment.

Approximately, two months after sowing the first crop is cut, this crop is generally light with only a couple of bales per acre harvested. Getting this first cut off, allows light down to the base of the crop and promotes tillering and good growth of the grass/clover sward.

After each cut, two thousand gallons of good quality cattle slurry is applied per acre to replenish nutrient offtake. Red clover swards have a high demand for nutrients and in particular phosphorus and potassium. The aim is to cut the crop a minimum of three and up to four times per year. In the autumn, one bag of muriate of potash per acre is applied to top up the potassium levels.

Last year, 27 bales per acre were taken from the grass/red clover swards. At this stage in 2024, with poorer spring and summer growth it is likely that the number of bales per acre will be reduced.

In previous years prior to red clover swards being available on farm, Aidan was constantly trying to gather enough silage for the winter and it was a struggle to dedicate specific paddocks to obtain the required amount of winter fodder. Now with the new grass/red clover swards in place, he has more peace of mind and is content knowing that he has designated areas for silage and these fields will give him adequate quantities of high quality silage.

The red clover silage from these plots have very good protein content with results of 16 to 18% protein the norm. Aidan feds this silage to both his

weanling and finishing animals and gets good results from both groups of stock.

In summary, red clover swards are working very well on Aidan Maguire's farm as they are specific fields that are destined for silage, they are high yielding and good protein content silages. Chemical nitrogen fertiliser application is greatly reduced and this helps to contribute to greenhouse gas emission reduction. Also, when the red clover reduces or dies out after four to five years, Aidan is still left with a high quality perennial ryegrass/ white clover sward.

Parasite control in calf-to-beef systems

Stomach Worms and Lung Worms

Irish dairy calf to beef production is predominantly grass based, the most successful systems are those that optimise animal performance from grazed pasture and achieve a high proportion of total life time gain from grazed grass. However these systems are particularly exposed to outbreaks of stomach worms and lung worms.

Calves are particularly vulnerable to infection from stomach worms and this can result in ill-thrift, with subclinical infection resulting in reduced growth rate. After their first grazing season cattle generally develop sufficient immunity to prevent clinical disease, however there has being numerous cases where older animals have had high levels of worm burden. Symptoms of stomach worms can include diarrhoea, decreased appetite and loss of weight. Stomach worms can cause severe damage to the stomach and small intestine which will cause parasitic gastroenteritis. Cattle in Ireland are usually infected with a number of stomach worm species, the most common being Ostertagia ostertagi and Cooperia oncophora.

Control of stomach worms on dairy calf to beef farms is usually achieved by the administration of anthelmintic doses. There are currently three classes of anthelmintic licensed for the control of stomach worms in cattle: benzimidazole; levamisole; and, macrocyclic lactone (Ivormec).

The level of worm burden in a herd can be ascertained by counting the number of worm eggs per gram (epg) of faeces (faecal egg count or FEC). Most veterinary practices offer a faecal testing service to help determine if dosing for worms is required. In order to avoid worm resistance building up on farms, farmers should take dung samples to see if a worm dose is warranted or not.

In the case of lung worm monitoring for clinical signs such as a husky cough or difficult breathing is the best way to identify if there is an issue. Heavy infestations can lead to respiratory disease or pneumonia. As regards treatment and control most available anthelminthics are effective against larval and adult lungworms.

Pre-housing dose

About two week's pre housing it is advisable to treat for lung worm to ensure stock are clean of any burden. Heavy burden and treatment post housing can cause unnecessary stress trying to cough up dead larva and this can often lead to respiratory issues.

Controlling Liver Fluke this winter

Lack of thrive, poor appetite and reduced weight gain are all ill effects of liver fluke therefore farmers need to act early to prevent any issue. Once eaten fluke starts to feed and grow. It takes approximately twelve weeks for the flukes to grow to adult stage when they start to lay eggs. These eggs pass out in the faeces of the animal and when conditions are suitable they hatch and use the mud snail to continue the life cycle. During this twelve week period the fluke are classified according to their stage of development:

First 5-6 weeks – early immature fluke

Weeks 6-10/11 – Immature fluke

Week 11 + - Adult fluke

Faecal sampling can be used as an aid in monitoring liver fluke but the fact that eggs are only shed by mature fluke farmers need to be cautious in waiting that long if there an issue on their farm. The beef health check programme on farmer's individual ICBF profiles contains useful information regarding liver damage caused by fluke off cattle that were previously killed on the farm. This will help determine if liver fluke is high in your particular farm.

There are a number of different flukicides on the markets but certain products are only effective again certain stages. Some of the flukicides on the market are only effective against the adult stage therefore careful thought needs to be given when deciding what product to use and the timing of the treatment. If using a product that only treats adult fluke stock need to be in at least 11 weeks to ensure an effective treatment. In areas where burdens are high and farmers need to intervene quick triclabendazole based products which cover all thee stage can be given a few weeks post housing, there is some known resistance to this product in certain parts of the county so precaution is advised. In other cases there are a number of products that also effective again mature and immature and these will

give an effective treatment if administered 6 weeks after housing. When selecting a product check the product label to check the stages treated. Table 1 outlines examples of drugs useful in control of liver fluke in cattle and the stages treated.

Table 1: Active ingredients and stages treated

Active Ingredient	Liver Fluke Stage		
	Early Immature	Immature	Mature
Triclabendazole	✓	✓	✓
Closantel		✓	✓
Clorsulon			✓
Oxyclozanide			✓
Nitroxynil		✓	✓
Rafoxanide		✓	✓
Albendazole			✓

Aidan Maguire dosing plan

With regards stomach and gut worms Aidan takes regular dung sampling to assess faecal egg counts (FEC). Where readings in excess 200epg are recorded a treatment is administered. In the case of lung worm Aidan monitors for clinical signs and as soon as isolated husky coughs start no time is wasted in treating. Early in the grazing season white drenches are generally used with yellow and clear products used then later in the year. Given the dry nature of the farm fluke generally is not an issue but given the weather conditions of the last few years this autumn will be monitoring his beef health check reports from animals slaughtered and depending on results a decision to treat or not will be made.

Silage quality and winter diets

Grass silage will typically makes up around one quarter to one third of total feed dry matter (DM) consumed on dry stock farms. When compared to grazed grass it is quite expensive to produce (usually twice the cost per tonne DM), however when taken as part of an integrated grazing system it is good value compared to concentrates and alternative forages. While most beef farms have tended to secure adequate supply of silage tonnage in recent years, average silage quality (as measured by dry matter digestibility, DMD) remains consistently poor on dry stock farms at 65-67% DMD. The target over winter months is at least 0.6 kg/day for steer and heifer weanlings and 0.9 kg/day for finishing heifers and over a kilo a day for steers where silage of 65-67% DMD is only capable of supporting a daily live weight of 0.3-0.4kg/day for stock without the inclusion of meal.

Silage Analysis

Completing silage analysis is the first step to seeing what quality silage is in the yard and then putting a feeding strategy in place to ensure that the nutritional requirements of stock are met and that the desired level of performance is achieved over the winter. Visual assessment alone is not adequate to determine silage quality.

A laboratory test will provide accurate information on silage nutritive value and preservation and allow informed concentrate feeding decisions for the category of stock to be fed. This is best measured as digestibility of the crop dry matter (DMD); protein content is also important and is positively associated with DMD. Silage quality is a function of growth stage at cutting (leafy swards have higher DMD than stemmy swards).

Table 1: Guideline daily feeding rates based on silage quality (DMD)

Animal type	Target ADG	66 DMD	68 DMD	70 DMD	72 DMD	74 DMD	76 DMD
Weanling	0.6kg/day	1.8kg	1.5kg	1.2kg	0.9kg	0.6kg	0.4kg
Finishing steer	1kg/day	7.0kg	6.0kg	5.5kg	5.0kg	4.0kg	4.0kg
Finishing heifer	0.9kg/day	7.0kg	6.0kg	5.5kg	5.0kg	4.0kg	4.0kg

Silage sampling

Silage samples must be taken carefully to ensure correct results. A period of 5-6 weeks should elapse between ensiling and sampling. A long core sampler should be used with 3-5 cores taken from well-spaced points on or between diagonals on the pit surface. Alternatively sample an open pit by taking nine grab samples in a 'W' pattern across the pit face.

When testing bales, a number of samples from each batch are needed to get a representative sample.

Table 2: Key information provided from silage analysis

Unit of measure	Meaning	Low	High	Target
Dry Matter (%)	Feedstuff less water content	13-17	40-55	28-32
pH	Measure of acidity	3.4-3.7	4.5-5.5	3.8-4.5
Ammonia – N (%N)	Indicator of grass N content at cutting	4-7	15-25	<10
NDF (% DM)	Measure of forage fibre and intake potential	42-47	55-65	<44
DMD (%)	Measure of quality	55-65	76-80	>72
ME (MJ/kg DM)	Energy content (linked to DMD value)	8-9	11-12	>11
UFV/UFL (unit/kg DM)	Energy content (linked to DMD value)	0.6-0.7	0.89-0.96	>0.89
Crude Protein (% DM)	Measures N as indicator of true protein content	7-9	15+	>13.5
Ash (% DM)	Indicator of soil contamination	5-6	12-15	<8.6

Table 3 outlines the potential farm-scale value of taking this approach to achieve the correct target silage DMD. In this simple example, a farm with 40 weanlings and 40 forward store cattle requires 350 silage bales for a standard winter. The cost of total winter concentrates required to maintain target performance is reduced by 47% by moving from national average silage quality to target silage quality for the stock type on hand.

Table 3. Effect of silage quality (dry matter digestibility, DMD) on winter concentrate costs for a calf-to-beef farm

		High DMD	Low DMD
Number of cattle	Weanling cattle	40	40
	Store cattle	40	40
Silage type and quantity of bales needed	High quality bales - 74% DMD	350	0
	Low quality bales - 66% DMD	0	350
Winter concentrate cost @€340/tonne		€5,181	€9,792

Finishing diet considerations

Energy intake is the main determinant of live weight gain of cattle. Therefore, maximising energy intake is important. Steers and heifers have a relatively low requirement for protein during the finishing period. Aim for 11-12% crude protein (CP) / kg diet dry matter (DM). For bulls that are growing (up to 550 kg LW) aim for 13-14% CP / kg diet DM. For finishing bulls (greater than 550 kg LW) aim for 11-12% CP / kg diet DM.

Where forage makes up a large proportion of the diet, fibre levels are likely to be adequate. When feeding meals ad lib, ensure that animals receive at least 10%-15% of their dietary dry matter as straw, hay or grass silage, in order to maintain rumen function.

All finishing animals should receive appropriate minerals for the duration of the finishing period. For grass silage-based diets this is a general purpose mineral. For diets based on alternative forages (e.g. maize silage) or fodder / sugar beet feed a maize/beet mineral. On ad lib concentrate diets, ensure that the inclusion rate of the mineral matches the feeding rate of the ration.

The water requirement of finishing cattle depends on the proportion of dry feeds i.e. concentrates in the diet. Animals on an ad lib diet will have a much higher requirement for water than animals on a grass silage-based diet. Under normal conditions (free access to feed, silage, etc. and water), an animal will consume approx. 20 litres of water over a 24-hour period. This could be 1.5-2.0 times greater for ad lib concentrate systems. Water trough size therefore is an important consideration in a beef finishing shed. Small type nose drinkers are unsuitable due to the small volume an animal

can ingest at any one time. A trough that can be cleaned easily and quickly on a daily basis is needed also.

Table 3. Ration feeding for finishing cattle

Category	Silage quality	Concentrate feeding rate (Kg/ day)
Steers	70% DMD	5-6
Heifers	70% DMD	3-4
Bulls	70% DMD	Ad lib

Options to deal with fodder deficits

Following a wet spring and prolonged winter housing period, silage and fodder reserves on many farms were completely exhausted at turnout. Reduced growth rates over the summer has further added to the challenge of replenishing silage stocks on many farms to ensure adequate fodder is available for the next winter housing period and for any unplanned times of wet weather or drought conditions.

1. Complete a fodder budget

Completing a fodder budget is a worthwhile task and all farmers should complete one to access their own current situation. Completing a fodder budget is a two-part process it involves working out how much feed you have on you farm and working out how much feed you need. Varying weather patterns over the last number of years make it very difficult to predict how many months fodder are now required therefore no matter what region of the country your farm is located in, it is best to target fodder availability/ reserve for at least 6 to 7 months

2. Extend grazing season

Every opportunity should be made to utilise all available grass on the farm to extend the grazing season to reduce winter feed demand while also remaining mindful of closing paddock once grazed to ensure grass is available in spring for early turnout should conditions allow. Where slurry is available targeting grazed paddocks or those low in P or K is advisable, where fertiliser allowances still remain on farm spreading 20 units of nitrogen on drier parts of the farm would be a worthwhile investment.

3. Can some stock be finished off grass?

Notwithstanding the difficulties and safety of feeding finishing cattle at grass, with the right infrastructure, is it an option to finish some animals from grass with/without concentrates this autumn, thereby reducing the grazing demand in the back end of the year and more importantly reducing the winter fodder requirement.

4. Selling stock

Where stock are yet not quite ready for finishing would the option of selling more forward store animals live to reduce feed demand.

5. Buying silage bales

Can silage bales be sourced locally in order to enhance the silage stock on farm? Buying bales can be hit and miss at the best of times! Many bales can be excellent quality, but the range in quality can be very variable. Buying locally can be of great benefit if knowledge of the farm that the bales came from and the weather conditions at baling can be known. Generally bales bought earlier in the summer will be of higher quality than bales made later in the autumn,

6. Feeding extra concentrate.

While feeding extra concentrates to substitute silage is an expensive option to deal with fodder deficits farmers are sure of the quality of feed they are getting and animal performance will be maintained.

7. Buy beet

Beet may be an option in some instances to fill the gap where fodder is in short supply, although many farms may not be in a position to feed beet. If thinking of buying beet it is important to consider, storage, washing, chopping and feed out of the beet, have you the machinery to complete these tasks? Also bear in mind that depending on the type of animal being fed, the overall diet will need to be adequately balanced to meet their nutritional requirements.

All options come with a cost, so ensure that provisions are made to pay for these and that they are viable.

Fodder Budget – Winter Requirements 2024/2025				
	A	B	C	
Animal Type	No. of stock to be kept over winter	No. of months (Include 4–6 week buffer)	No. bales required per month	Total silage bales required (A x B x C)
Suckler Cow			1.7	
0 -1 year old			0.9	
1 -2 year old			1.35	
>2 year old			1.7	
Ewes			0.15	
Total SILAGE BALES required				Bales
Total tonnes PIT SILAGE required (Total bales / 1.25)				Tonnes

Notes/Assumptions:

Dry Matter = DM

Silage bale at 25% DM has 200kgs DM per bale

Pit silage is assumed 25% DM

If concentrate is also fed, it will reduce the total amount of silage required per head per day.

A minimum of 4 – 6 weeks of a buffer should be included.

Fodder situation on Aidan's farm

The amount of fodder required on a dairy calf to beef farm will vary significantly depending on the system that is being run on the farm. In a 20 month heifer system, silage requirements will be low due to a lot of the heifers being finished off the farm before their second winter. Whereas in 24 month+ systems winter silage requirements will be high as there will be a lot of bigger cattle on the farm with a large silage requirement.

Aidan has a mix of heifers and steers on his farm with around 90 cattle being finished before Christmas, the leaves a short winter for the majority of the bigger cattle. The remaining 24 cattle will be finished out of the shed before the end of February. The weanlings on this farm are usually housed by mid-November and are back out on-off grazing by the middle of February. On a normal year, yearlings will out full time by the middle of March.

Currently Aidan has made 790 high quality bales of silage, the plan is that there will be another 150 bales before the end of the year giving Aidan enough silage for 4 months however in reality the big cattle will never have a full 4 month winter as the majority will be finished after only 60-90 days so there should be a surplus of silage left over for the yearling cattle to last at least 5 months.

Fodder Budget – Aidan's Winter Requirements 24/25

	A	B	C	
Animal Type	No. of stock to be kept over winter	No. of months (Include 4 – 6 week buffer)	No. bales required per month	Total silage bales required (A x B x C)
0 -1 year old (No Meal)	0	0	.9	0
0 -1 year old (1.5 kg meal)	170	4	0.7	476
1 -2 year old(No meal)	0	0	1.35	0
1 -2 year old (5 kg meal)	114	4	1	456
>2 year old	0	0	1.7	0
Total SILAGE BALES required			932	Bales
Total tonnes PIT SILAGE required (Total bales / 1.25)			745	Tonnes

The Signpost Programme: meeting our greenhouse gas emissions targets to 2030+ on beef farms

The main technologies that farmers are being asked to adopt to reduce greenhouse gas (GHG) emissions are those that reduce costs and/or improve profitability while also reducing emissions. These technologies include: improving animal performance through better genetics; reducing age at slaughter; implementing a herd health plan; increasing days at grass; using protected urea to replace CAN and straight urea; reducing chemical nitrogen use through improved soil fertility and in particular liming; optimising the use of organic manures; and incorporating clover into grassland swards.

The Signpost Programme

The Signpost Programme, led by Teagasc, is a collaboration of farmers, industry, state organisations, farm organisations and media all working together to support and enable farmers to farm more sustainably. The main focus of the programme is to reduce greenhouse gas (GHG) emissions but also to improve water quality and enhance biodiversity on Irish farms. The Signpost Programme is taking a holistic view of sustainability, encompassing economic, social and environmental sustainability.

Current technologies to reduce emissions

There are a suite of technologies currently available to beef farmers to reduce our greenhouse gas emissions. The key technologies available to beef farmers include:

1. Reduced age at slaughter

Finishing animals older at slaughter results in higher lifetime emissions from greater quantities of methane produced, additional emissions from slurry stored and spread and dung and urine excreted during grazing. The economic impact of increased weight gain is estimated at €0.21 per kg beef produced for an increase of 100g /head / day in lifetime performance. The

impact of increased weight gain on GHG emissions is estimated at 2% per 100 g increase in lifetime average daily gain for beef cattle systems.

2. Health

The implementation of a comprehensive health plan will improve the efficiency of the farming system and reduce GHG emissions by reducing age at slaughter.

3. Grassland

Increasing the grazing season length lowers GHG emissions. Grazed grass has higher digestibility than grass silage resulting in improved productivity and less energy lost as methane. Also, the ensuing shorter housing period means less slurry stored and less slurry to be applied, resulting in less emissions.

4. Protected urea

Nitrous oxide (N2O) is a GHG which has almost 300 times more global warming potential than carbon dioxide (CO2). It is lost to the atmosphere from the breakdown of organic and chemical fertiliser. The spreading of chemical fertilisers including calcium ammonium nitrate (CAN) emit high levels of N2O. Protected urea is designed to slow the rate at which urea is converted to ammonium, reducing N2O emissions. Protected urea is 25-30% cheaper than CAN and grows similar grass yields. Protected urea has 71% lower nitrous oxide emissions than CAN.

5. Reducing chemical nitrogen use

In addition to switching to lower emitting forms of fertilizer, reducing total quantities of chemical N reduces N2O emissions. A reduction in N fertiliser of 10 kg per ha will reduce farm GHG emissions by 1% and improve income by €10 / Ha.

How to reduce farm inorganic fertiliser application rate?

- ***Improving soil fertility and in particular liming***

Soil sampling and the implementation of a nutrient management plan are key to reducing chemical N fertilizer use. Spreading lime to increase soil pH

has the potential to release up to 80 kg N from the soil and yield a return of €6-10 for every €1 spent on lime.

- ***Optimising the use of slurry***

Slurry is a valuable source of fertilizer particularly if it is applied at the right time of the year (spring), using the right equipment (low emissions slurry spreading (LESS) equipment). Spring application captures an extra 3 units N / 1,000 gals of slurry and using LESS contributes an additional 3 units N / 1,000 gals of slurry. Spring application also reduces the storage period and the associated emissions. A 20% shift to spring application can reduce farm GHGs by 1.3% while a shift to trailing shoe can lead to a reduction of 0.9% in GHG emissions.

- ***Incorporating clover***

Incorporating clover into grassland reduces the demand for chemical nitrogen. Therefore, if there is less chemical N fertilizer spread, there is less N2O being emitted into the air. Clover has been shown to 'fix' the equivalent of 100 kg inorganic N/ha from the atmosphere.

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