Dairy Beef Village

The Dairy Beef Gene Ireland Breeding Programme: Enhancing Efficiency through the use of the Dairy Beef Index

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Summary

- The Dairy Beef Gene Ireland programme identifies and tests top-ranking AI sires to enhance the genetic merit of dairy beef calves using the Dairy Beef Index (DBI)
- Progeny from elite test bulls show improved carcass weight, feed efficiency, and reduced age at slaughter, while maintaining calving ease and gestation length
- Tools like the DBI and Commercial Beef Value (CBV) support informed decision-making, promoting economic viability and environmental sustainability of dairy and beef production

Introduction

The Irish Cattle Breeding Federation (ICBF) launched the Dairy Beef Gene Ireland breeding programme in 2015. At the heart of this initiative is the Dairy Beef Index (DBI), a multi-trait selection index tool designed to identify sires that produce high-performing beef calves from dairy cows without compromising on the productivity of the dairy herd.

The primary objectives of the Gene Ireland programme are to:

- Improve the genetic merit of beef calves from the dairy herd
- Optimise the balance between dairy performance and beef traits
- Enhance economic returns for both dairy and beef farmers
- Reduce the environmental footprint of beef production

How the Gene Ireland programme works

At the heart of the Gene Ireland programme is the annual selection and progeny testing of a panel of young genomic AI sires, chosen for their potential to excel in beef production. These sires must rank within the top 20% across breed on the DBI. Once identified on bull breeder farms, the bulls are purchased by participating AI companies.

A central feature of the Gene Ireland programme is the co-ordinated distribution of AI straws to participating commercial dairy farmers. Typically, each farmer receives a pack containing four bulls, with at least ten straws per bull. This approach guarantees a diverse sire mix within each herd, which is vital for producing accurate and unbiased genetic evaluations. The most successful of these sires are then eventually returned to wider commercial AI post progeny testing. The average straw allocation per herd is 35. The key operational statistics relating to Dairy-beef Gene Ireland programme are in Table 1.

Through close collaboration with AI companies, farmers, meat processors, and research institutions, the Gene Ireland programme continuously collects and analyses data to refine its strategies and accelerate genetic progress across the industry. Central to this process is the ICBF database, which captures a wide range of information— from insemination records and calving data to growth metrics and carcass characteristics, including meat quality. The differences in the level of data recording in Gene Ireland versus non-Gene Ireland herds is displayed in Table 2.

Table 1. *Dairy Beef Gene Ireland Statistics*

Description	Count
Years in operation	10
Progeny test herds 2024	600
Average cow herd size 2024	150
Straws distributed per year	21,000
Average straws per herd	35
Straws distributed per sire	500
Bull testing capacity per annum	40
Average number of calves per 500 straws	200
Total AI sires tested to date	258
Total progeny of these AI sires	664,085
Total progeny of these AI sires in Tully	1,276

Table 2. *Data recording in 2023 Gene Ireland (GI) versus Non-Gene Ireland herds*

Metric	GI Herds	Non-GI Herds
Number herds	525	14,325
Average number of dairy cows	183	95
Average number of beef calves	98	65
% beef calves with recorded insemination	78	42
% beef calves with recorded sire	90	59
% beef calves with calving score	97	73
% beef calves genotyped	71	24
% beef calves with liveweight record	19	13
Average number of sires used per herd	10	4

A subset of Gene Ireland sired progeny are raised on research partner farms, where they are assessed for traits such as methane emissions and feed intake at pasture as well as being ultrasound scanned to determine the optimal finishing age. Additionally, each autumn, a group of animals are sent to the ICBF operated Tully Test Centre, where data on feed and water intake, methane output, and meat quality are gathered under controlled finishing conditions. Approximately 600 animals are evaluated at the Tully Test Centre annually across the dairy and suckler herd. All collected data are stored in the ICBF database. While some of it is already used in genetic evaluations, other information is being compiled for future trait development and index validation such as methane, ultrasound scanning and water intake.

The rapid reintroduction of top-performing Gene Ireland sires into wider AI use accelerates genetic progress, as these sires are often selected by bull breeders to produce the next generation of AI sires.

Conclusion

The Dairy Beef Gene Ireland programme demonstrates how strategic, data-driven breeding supported by industry-wide collaboration can deliver sustainable improvements in both dairy and beef production.

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Impact of sire beef genetic merit on dairy-beef system performance

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Summary

- The progeny of high beef genetic merit sires produced an additional 18 kg carcass weight than low beef genetic merit progeny
- Supplementation during the second grazing season reduced slaughter age by 1.5 months for Angus steers, avoiding a second housing period
- Overall high beef genetic merit sires improved profit per hectare by 15 and 53% compared to low beef genetic merit and HF sired animals, respectively

Introduction

Dairy-beef is an integral part of the beef supply chain in Ireland and offers the opportunity for profitable beef production. Dairy-beef systems require knowledge of calf rearing, animal health, and grassland management expertise. These skills, combined with calves sired by bulls of high beef genetic merit, can allow beef producers achieve high carcass output and profitable systems. The Dairy Beef Index, or DBI, is now a widely used selection index for dairy farmers to select beef sires for use on the dairy herd, without compromising on calving traits such as gestation and calving. In conjunction with this, the Commercial Beef Value, or CBV, gives each animal destined for beef production an estimated breeding value of their own genetic potential for beef production and allows beef farmers make more informed purchasing decisions at calf purchase time. A recent study in Teagasc Grange has shown that when beef sires are chosen using the DBI, whilst also ensuring they are of high genetic merit within the beef sub-index, the resulting progeny have higher carcass weight compared to progeny of lower beef genetic merit and Holstein Friesian sires, without compromising on calving traits.

Grange dairy-beef systems study

Calves were purchased in 2020 and 2021 from spring calving, Holstein-Friesian dairy herds across Ireland. Three sire groups were evaluated; 1) calves produced from Angus sires in the top 40% of the beef sub index (High Angus); 2) calves produced from Angus sires in the bottom 60% of the DBI beef sub-index (Low Angus); and 3) calves produced from Holstein-Friesian sires (HF). Across the three genetic groups, steers were managed under two contrasting pasture supplementation strategies, Grass-only and Supplemented. Grass-only calves received no concentrate supplement over the first summer grazing season (June-September), with Supplemented calves were offered 1 kg concentrate per day. All calves were offered high quality grass silage (75% DMD) ad-libitum, and 1.5 kg concentrate per day over the first winter. Post-turnout, grass-only steers rotationally grazed pasture only, and received no concentrate supplement outdoors. Grass-only steers were housed for a conventional finishing period on grass silage ad-libitum (72% DMD) plus 5 kg concentrate per day. Supplemented steers grazed pasture only post-turnout and, from 1 July, received 4 kg concentrate per day until being deemed finished at pasture. Steers were deemed finished upon reaching a body condition score of ≥ 3.75 (on a 1-5 scale), deemed to be equivalent of a EUROP carcass fat score of 3+. Bio-economic analysis of farm system performance was conducted using the Grange Dairy Beef Systems Model.

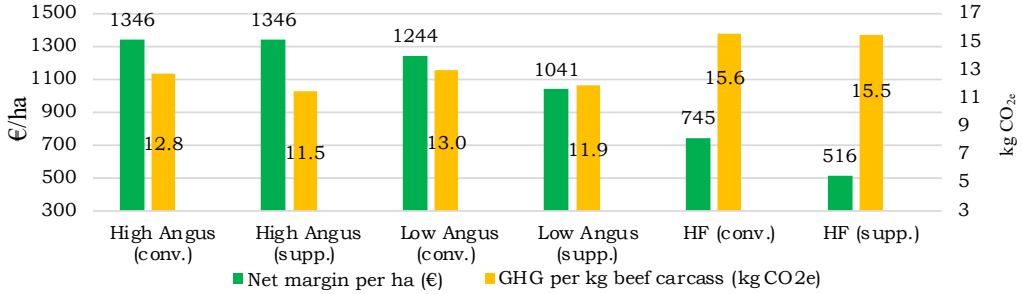
Results

Steer phenotypic performance is shown in Table 1. Both Angus genotypes had greater lifetime ADG compared to HF, with High Angus steers having the greatest lifetime ADG. Although finishing age was similar for both Angus groups, High Angus steers had a heavier carcass weight compared to Low Angus (+18 kg on average), and this difference was greater in the Supplemented group finished outdoors. Supplementation during the second grazing season reduced the slaughter age of Angus steers by 1.5 months, removing the need of a second housing period, however supplementation had no effect on the age at slaughter of HF steers, with HF steers requiring an indoor finishing period.

Table 1. *Slaughter performance of 2020 and 2021 born dairy-beef steers*

	Conventional			Supplemented		
	High Angus	Low Angus	HF	High Angus	Low Angus	HF
Slaughter age (months)	21.1	21.4	23.6	19.8	19.8	23.4
Carcass weight (kg)	314	306	311	310	284	328
Carcass conformation	O=/O+	O=	P+/O-	O=/O+	O=	O-
Carcass fat	3+/4-	3+	3+	4-	3+	3+/4-
Finishing days	51	62	127	101	99	162
Finishing concentrate kg	248	306	628	403	403	933
ADG lifetime (kg/day)	0.91	0.88	0.82	0.92	0.86	0.85

Results from this farm system study show that High Angus steers generated on average, 15 and 53% greater profit per hectare, than Low Angus and HF steers, and were also more carbon efficient (Figure 1). The greater individual carcass output per head of High Angus, allowed profit levels to be similar in both systems, even with the associated increased concentrate cost of this system. In contrast, the lower carcass weight of Low Angus, and higher feed costs of HF, reduced profit within the supplemented system compared to conventional management.



Base price of €4.85/kg. Finishing concentrate price €350/t. Protected urea price €550/t. ***Net margin excludes land & labour charge** and assumes a calf purchase price of €200 and €60 per head for early maturing (Angus) and HF bull calves.*

Figure 1. *Profit and carbon efficiency of dairy-beef steer systems of contrasting beef merit (High Angus, Low Angus and HF) and feeding strategy (Conventional vs. Supplemented)*

Conclusion

Selecting high beef genetic merit sires using the DBI, produce calves which have a higher lifetime growth rate, finish at younger ages, and produce heavier carcasses, without compromising on calving difficulty and gestation length. These high beef genetic merit calves are more profitable for the beef producer than both low beef genetic merit and purebred dairy animals, ensuring repeat custom and a stable outlet into the future for non-replacement calves from the dairy herd.

Recent trends in the national finishing age and carcass output of prime dairy-bred beef cattle

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Summary

- Reducing the national finishing age of beef cattle from 26 to 22-23 months can mitigate 0.73M t CO_2eq
- The annual decline in finishing age since 2018 for most categories of prime dairy-bred cattle was reversed in 2023 and 2024 due to challenging weather conditions
- The DAFM funded Beef-Quest research project is currently identifying the predominant nutritional, animal health and environmental factors impacting the lifetime growth of prime beef cattle

Introduction

Reducing the average finishing age of the national prime beef cattle population, is one of the most promising greenhouse gas (GHG) mitigation strategies for the Irish agricultural sector. Enhancing daily live weight gain, in order to facilitate an earlier finishing age, primarily reduces the quantity of methane emitted over the animal's lifetime. Indeed, Teagasc-led research has shown that a reduction in the national average finishing age from 26 to 22-23 months by 2030, has the potential to reduce Irish agricultural GHG emissions by approximately 0.73 million tonnes (Mt) of carbon dioxide equivalents (CO_2eq). With the proportion of prime beef cattle in Ireland originating from the dairy herd increasing from 45 to 60% over the past decade, it is imperative that strategies are developed to facilitate an early age at finish for dairy-bred beef animals, whilst maintaining beef output and improving profitability. An overview of trends in the national finishing age and carcass performance for dairy-bred beef cattle, from 2018 (base year for the Irish Climate Act) up until 2024, is presented. It should be noted that poor weather conditions in 2023 and 2024 had a negative impact on the growth rate of most categories of animals.

Dairy-bred steers

Since 2018, the proportion of dairy-bred steers from beef sires (DB) has increased from 53 to 61%. Early-maturing (EM) breeds are the most popular beef sire, accounting for 78% of Beef×Dairy steers. From 2018 to 2022, a reduction in the average finishing age of dairy×dairy (D×D; 27.8 vs 26.5mo), EM×D (27.0 vs 26.2mo) and late-maturing (LM)×D (28.4 vs 27.0mo) steers was observed, with minimal impact to carcass weights for EMxD and LMxD animals, but reduction in carcass weights from D×D steers (Table 1). However, in 2024, the average finishing age of D×D, EM×D and LM×D was 27.6, 26.9 and 27.9mo, respectively. In addition, in comparison to 2018, the average carcass weight of D×D (316 vs 302 kg), EM×D (327 vs 318 kg) and LM×D (359 vs 343 kg) steers decreased in 2024.

Dairy-bred heifers

Approximately 85% of dairy-bred heifers in 2024 were the progeny of beef sire breeds. On average, 70% of dairy-bred heifers, were sired by an EM bull between 2018 and 2024. The average EM×D heifer was finished four days earlier and 6 kg heavier in 2022 in comparison to 2018. Improvements in daily live weight gain of LM×D heifers was also observed between

2018 and 2022, such that carcass weights remained relatively consistent (~303 kg) but the average finishing age decreased by 4.8 days per annum. However, in 2024, the average finishing age of EM×D and LM×D heifers was, on average, 19 and 3 days older than 2018, respectively. In addition, from 2018 to 2024, the average carcass weight produced by LM×D heifers decreased by ~10 kg, with no change for to the average EM×D carcass.

Dairy-bred young bulls

Dairy×Dairy animals accounted for 59% of the dairy-bred young bulls finished in 2024. Similar to suckler-bred animals, the proportion of dairy-bred male cattle, finished as young bulls, declined between 2018 and 2024 (16.3 vs 9%). In comparison to 2018, D×D young bulls were finished at a similar age (21.0 vs 21.1mo), but produced a 10 kg lighter carcass, in 2024 (Table 1). Similarly, small changes to the finishing age of EM×D (-3 days) and LM×D (+9 days) bulls were observed between 2018 and 2024. However, over the same time period, the average carcass weight of EM×D and LM×D was 12 and 15 kg lighter, respectively.

Table 1. *Annual finishing age and carcass weight trends for dairy-bred beef cattle*

	Finishing age (months)				Carcass weight (kg)			
	2018	2022	2023	2024	2018	2022	2023	2024
Steers								
Dairy×Dairy	27.8	26.5	27.2	27.6	316	301	306	302
Dairy×Beef	27.3	26.4	27.0	27.0	334	334	330	323
Heifers								
Dairy×Beef	25.0	24.7	25.3	25.5	278	282	280	276
Young bulls								
Dairy×Dairy	21.0	20.7	20.8	21.1	312	309	303	302
Dairy×Beef	20.2	20.3	20.1	20.2	343	345	336	330

Beef-Quest

The national average finishing age of dairy-bred prime beef cattle is significantly higher than that which is currently being achieved on top-performing commercial beef herds and at research level. While year-to-year variation is inevitable (Table 1), understanding the key factors currently preventing growth rate targets from being achieved across the average beef farm, is essential to lower the national finishing age. The Teagasc lead Beef-Quest Project, funded by the Department of Agriculture, Food and the Marine, aims to investigate the effect of nutrition, health and on-farm environment factors presently constraining animal growth performance and the finishing age of cattle on beef farms and to assess their impacts on GHG emissions. In collaboration with ICBF and UCD, this project will use data currently available within the industry, as well as that which is generated from a new large-scale on-farm study. Overall Beef-Quest will identify, quantify and rank the primary on-farm technical and behavioural-related bottlenecks negatively impacting beef cattle finishing age. Using this new information, more targeted high-impact and deliverable solutions can be proposed and disseminated to reduce the finishing age of cattle, thus improving the sustainability of Irish beef production.

Teagasc DairyBeef 500: update on monitor farm profitability 2024

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Summary

- The Teagasc DairyBeef 500 campaign was launched in 2022 and provides programme farms with intensive advice from dedicated campaign advisors on grassland management, financial management and herd health to achieve a target net profit of €500/ha excluding all subsides
- Net profit on programme farms increased from €542/ha to €717/ha between 2023 and 2024 due to increased beef carcass prices and reduced feed and fertiliser prices
- Wet weather in 2023 and early 2024 reduced animal performance at grass and silage quality while increased emphasis on farm development has resulted in increased fixed cost during 2024

Introduction

The Teagasc DairyBeef 500 campaign was launched in 2022 and consists of 15 monitor farms nationwide, a knowledge transfer programme, a standalone calf to beef demonstration farm, a new entrant calf to beef course and the publication of a dairy calf to beef manual. The majority of the monitor farms have been involved in Teagasc programmes since the Teagasc Green Acres programme. The programme farms receive intensive one-to-one advice from dedicated campaign advisors on grassland management, financial management and herd health. The target net profit for the farms is €500/ha excluding all subsides. The programme farms range in size from 24 to 92 ha and are made up of part time and full-time farmers. All programme farms run a calf to beef system as their main enterprise with some farms running additional enterprises on a smaller scale such as store to beef, sheep or tillage.

Cost decreases in 2024

Fertiliser costs decreased steadily as the year progressed with an overall decrease of 24% over the full 12-month period. This encouraged farmers to refocus on spreading phosphorus and potassium type compounds to build soil indices in addition to extra spending on lime and reseeding to improve pasture performance. Additional nitrogen was also spread on some demonstration farms in 2024 due to reduced clover levels and poorer than expected grass growth during summer 2024. Concentrate prices also decreased by 8-10% in 2024, and this reduced the cost of finishing cattle indoors.

Earlier age of slaughter

Many of the monitor farms have moved to a more efficient early slaughter system, designed to minimise the need for a second winter indoors and to avoid a third grazing season. Over the previous five years, slaughter age had reduced, resulting in a large number of cattle being slaughtered between October and early February. However, beef prices did not rise to the levels expected in early 2024, leading to poorer-than-anticipated returns. A significant increase in beef prices did not materialise until winter 2024 and spring 2025. In response to the rising price trajectory from late 2024 into spring 2025, some monitor farms deferred slaughter to take advantage of higher prices, which led to a larger-than-usual carryover of stock inventory. To maximise carcass value, monitor farms also increased the slaughter age to improve carcass weights, particularly after poor growth performance during the 2023 and 2024 grazing seasons. In 2024 compared to 2023, dairy x dairy steers showed a 2 kg reduction in carcass weight while maintaining a 24-month slaughter age; dairy x beef

steers increased carcass weight by 10 kg but extended the slaughter age by 1.8 months; dairy x beef heifers increased carcass weight by 6.6 kg while reducing slaughter age by 0.3 months; and dairy bulls increased carcass weight by 4.6 kg while increasing slaughter age by 0.3 months.

Table 1. *Physical and financial performance of the DairyBeef500 monitor farms during 2023 and 2024*

	2023	2024
Organic N stocking rate (kg/ha)	189	181
Gross output (kg LW[1]/ha)	1,322	1,297
Gross output (kg LW/LU)	558	573
Gross output (€/ha)	3,330	3,405
Variable costs (€/ha)	1,990	1,856
Variable costs (% of gross output)	60	55
Gross margin (€/ha)	1,341	1,548
Fixed costs (€/ha)	799	831
Total costs (€/ha)	2,788	2,693
Total costs (€/kg LW)	2.14	2.06
Net profit (€/ha)	542	717
Net profit (€/kg LW)	0.39	0.55

[1]*LW=Live weight*

High output systems

From the figures presented in Table 1, it is evident that the average stocking rate on monitor farms is moderately high at 2.3 LU/ha (181 kg organic N/ha). In any beef system, a high level of beef output is required to leave a high gross margin to cover fixed costs and leave a substantial net margin for farmers before subsidies. The monitor farms in this programme are consistently achieving 1,300-1,400 kg of live weight (LW) per ha which can deliver net margins in excess of €500/ha. Higher calf prices during 2025 will erode the bottom line on these farms in the absence of significant increases in beef prices at time of slaughter. At 2.3 LU/ha, a €150 increase in calf price would reduce farm net profit by €345/ha.

Conclusion

Among the characteristics of farms achieving net profits in excess of €500/ha, having a large proportion of grazed grass and grass silage in the animals' diet, achieving good herd health status including vaccination policies against pneumonia and increasing attention to detail during the rearing phase and transition from milk to grass were essential components. Indeed, a number of the farms achieved a net profit of between €700 and €1,200 per hectare within the programme placing these farms in a financially sound position for 2025 given higher output levels to capitalise on higher beef prices. Nonetheless, inflated calf prices during 2025 remains a significant threat to future farm profitability in the current economic climate.

Tipperary Dairy Calf-to-Beef Demonstration farm update

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Summary

- Tipperary Dairy calf to beef demonstration farm is a 112 ha dairy-beef enterprise established in 2022 by Teagasc in Fethard, Co Tipperary with the support of Dawn meats and Shinagh Dairy farm through a joint venture. The aim of the farm is to demonstrate the best technologies for profitable and sustainable production of beef calves from the dairy herd
- The farm is focusing on key technologies to optimise animal performance at all stages of production to reduce age at slaughter through excellent pasture management, improved animal genetics and herd health planning to minimise morbidity & use of antibiotics and anthelmintics

Background

The recent expansion of the national dairy herd coupled with the exponential growth in sexed semen sales has resulted in an increasing number of dairy-beef calves being born on Irish dairy farms each year. These calves represent a potential opportunity for Irish beef farmers to have a viable and sustainable enterprise, if all of the critical links in the supply chain are managed and optimised. The dairy beef supply chain currently includes the pedigree beef bull breeders, AI companies, dairy farmers, beef farmers and beef processors but, the critical points are the genetics of the sire selected by the dairy farmer, the seamless transfer of a healthy calf from the dairy farmer to the beef farmer and the efficiency and productivity of the animal while on the beef farm. The Tipperary dairy calf-to-beef demonstration farm is based at Ballyvadin, Fethard, Co. Tipperary is a joint venture between Teagasc, Dawn meats and Shinagh estates limited and is endeavoring to demonstrate the deployment of best practice technologies in profitable and sustainable beef production for beef farmers.

Farm system

The Tipperary Beef Farm is 112 ha of free draining clay loams and approximately 95 ha is used for the dairy beef enterprise. This was sown with perennial ryegrass/clover swards in 2022 and is being managed as a grass clover system with moderate levels of artificial nitrogen application (~150 kg N/ha/yr). The farm was stocked initially with 325 calves in 2023, 335 calves in 2024 and 380 calves in 2025. These are all reared through to beef as steers and heifers. The animals are slaughtered when they reach adequate fat cover and the age at slaughter will determine the feed demand and the number of animals reared is adjusted based on forage supply and demand. The target is to maximise production from grazed grass and high quality silage and finish all cattle to meet factory specification (>O=, >260kg carcass and fat score between 2+ and 4-). In 2023, the farm grew 12.5 t DM/ha and 11.7 t DM/ha during 2024.

Calf purchase

The demonstration farm team work closely with the source dairy farms to ensure that the beef genetic merit of the calves continues to improve year on year by providing a list of recommended beef AI sires for use on the source dairy herds.

2023 born livestock

In spring 2023, the farm purchased 325 February and March born calves at an average of 45 kg body weight and 22 days of age from four source dairy herds which included our project partner, Shinagh Dairy Farm. With the exception of 50 steers were sent to the Irish Cattle Breeding Federation's (ICBF) research facility in Kildare for feed efficiency and methane emissions evaluation prior to slaughter, the remaining animals were finished on the Tipperary Dairy Beef Farm and their performance is outlined in Table 1 below.

Table 1. *Beef performance of 309 steer and heifer animals finished to beef on the Tipperary Dairy Beef Farm during 2024*

	Steer	Heifer
Number of animals	200	109
Carcass weight (kg)	301kg	257kg
Carcass grade	O=	O=
Fat score	3-	3+
Age at slaughter (months)	22.3	20.6
Carcass value (€)	1,885	1,425
Carcass price (€/kg)	6.10	5.62

2024 born livestock

In spring 2024, the farm bought 335 calves from seven source dairy farmers at an average weight of 47 kg and at an average age of 21 days. The weight preformance of these animals is outlined in Table 2.

Table 2. *Weight performance of 335 steer and heifer animals on the Tipperary Dairy Beef Farm during 2024*

28/04/2025	Weight	ADG since arrival
Male	358kg	0.78kg/day
Female	339kg	0.73kg/day

2025 born livestock

In Spring 2025, the farm purchased 381 calves at an average age on arrival of 24 days and at 47 kg bodyweight. These calves were procured from a list of beef AI bulls given to the dairy farmers during the previous breeding season. There are 11 dairy x dairy calves in this group with the remaining 370 dairy x beef calves made up of Aberdeen Angus, Aubrac, Charolais, Hereford and Limousin sired genetics.

How to progressively determine the value of dairy-beef calves

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Summary

- Sex, beef genetic merit (Commercial Beef Value; CBV) and calf arrival weight are important criterial in determining the value of dairy-beef calves
- No significant effects of sire breed were observed on calving difficulty, gestation length or dam calving interval, supporting the use of terminal sires based on calving ease and dam suitability
  - » Each 1 kg increase in purchase weight results in an additional 1.1 kg carcass
  - » 1-star CBV animals produced carcasses worth €210 less than those of 5-star animals

Introduction

Based on analysis of 2022 and 2023 born cattle finished on the Tipperary dairy calf-to-beef demonstration farm, several factors under farmer control have been identified, which form the basis of calf purchase agreements. Two key factors are calf arrival age and Commercial Beef Value (CBV).

For every 1 kg change in calf arrival weight on the Tipperary farm, there is a corresponding 1.1 kg change in carcass weight at slaughter. This relationship forms the basis of the €8/kg liveweight adjustment to the calf purchase price for each kilogram deviation from the 55 kg base liveweight.

The CBV is also used to guide calf purchase price. It reflects the beef merit of both the sire and dam, providing an estimate of the calf's own beef merit and its overall suitability and profitability for finishing on the Tipperary farm. Calves purchased for the farm come from a range of dam types with varying levels of beef merit.

Beef-sired progeny from Jersey-cross dams showed reduced carcass weight (–15 kg) and lower conformation scores (–0.5 units), emphasizing the importance of using high-beef-merit sires to offset the lower beef production efficiency associated with Jersey-influenced cows.

Sire breed had no significant effect on calving difficulty, gestation length, or the subsequent calving interval of dams across herds. This suggests that an opportunity exists to optimise sire-dam matings based on sire calving ease, dam parity, and direct calving difficulty.

Performance by animal type:

- Dairy-beef **heifers** finished at 20.6 months had an average carcass weight of 257 kg. They graded O+/O= for conformation and 3-/3= for fat, achieving an average sale price of €1,354 over two finishing years.
- **Beef × dairy steers** produced a 301 kg carcass at 21.6 months, grading O+/O= for conformation and 3- for fat, with a carcass value of €1,692.
- **Dairy × dairy steers** had lower-value carcasses (€1,575) at 23.3 months, requiring longer finishing periods. Their carcasses averaged 295 kg, with a conformation grade of P+ and a fat score of 2+/3-.

Given the limited shed capacity for finishing and the farm's focus on producing "in-spec" carcasses at younger ages, dairy × dairy animals purchased onto the farm will be restricted to male calves produced from female sexed semen (~10%).

The CBV remains an effective predictor of carcass value. When evaluated across animals of different maturities and genders at the same slaughter age, 1-star CBV animals produced carcasses worth €210 less than those of 5-star animals. This difference narrowed to €40 between 4-star and 5-star animals.

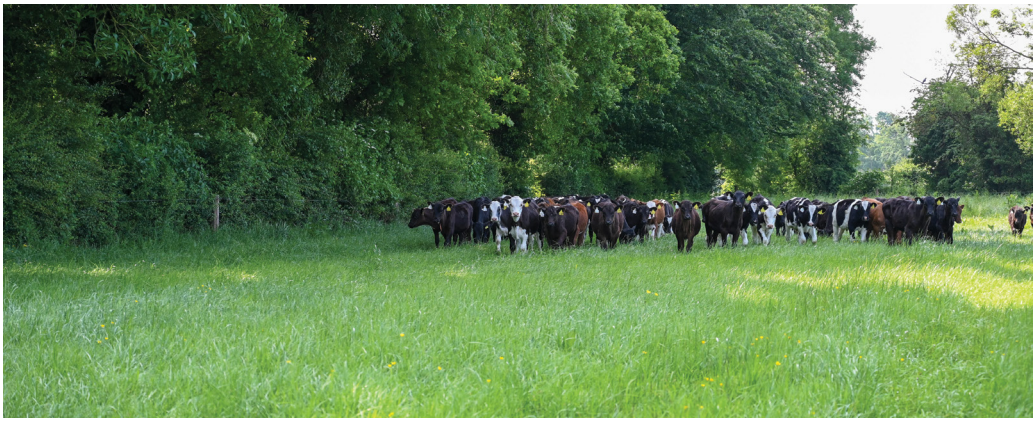
Calf purchase specification for Spring 2026

To encourage the supply of calves with increased CBV and weight for age, a progressive calf purchase agreement has been devised for the Tipperary dairy calf to beef demonstration farm:

- Only calves born on or before the 31st of March and progeny of the agreed AI beef sires are eligible for purchase.
- All calves are to be made available to the beef farm for purchase, and the beef farmer has the right to refuse purchase if a calf doesn't meet agreed criteria.
- Calves are given a base price which reflects that of bulls and heifers sold through livestock marts nationally, using a base liveweight of 55 kg and a CBV of €96.
- Beef x dairy calves will be priced based on a reference CBV of €96 (equivalent to a 4-star rating). For every €1 variation in CBV above or below this base value, the calf price will increase or decrease by €1.50.
- Each 1 kg of liveweight on arrival at beef farm above or below 55 kg will result in the calf price being adjusted up or down by €8/kg from the guide price.
- The calf price will be calculated based on the weight of the calf recorded on arrival at the Tipperary beef farm.
- Minimum age for transport to the beef farm is 14 days of age at a minimum of 38 kg, as outlined in Table 1.

Table 1. *Minimum calf weight per day of age (at arrival on Tipperary Farm)*

Day	kg	Day	kg	Day	kg	Day	kg	Day	kg	Day	kg
14	38.0	19	41.0	24	44.0	29	47.0	34	50.0	39	53.0
15	38.6	20	41.6	25	44.6	30	47.6	35	50.6	40	53.6
16	39.2	21	42.2	26	45.2	31	48.2	36	51.2	0.6 kg ADG	
17	39.8	22	42.8	27	45.8	32	48.8	37	51.8	per day of age	
18	40.4	23	43.4	28	46.4	33	49.4	38	52.4	thereafter.	



Procurement protocols for dairy-beef calves on DairyBeef 500 programme farms

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Summary

- Sourcing a healthy calf is key to the profitability of dairy calf to beef systems
- A strict calf purchasing policy should be established from the outset
- Minimise the number of source farms that bought in calves come from

Introduction

Each year, over 2,500 dairy beef calves are purchased onto DairyBeef500 participating programme farms from a range of farm sources. The aim of the programme farms is to minimise the number of sources that calves are purchased from in order to reduce the disease risk. Given the large numbers of calves required on some farms, this can be a challenge, and it is often necessary to buy from multiple farm sources. Some of the DairyBeef500 farmers have built up good relationships with dairy farmers and calves are sourced directly from farm-to-farm. Other programme farmers buy their calves through marts or local agents.

Calf selection

It is recommended to always buy from a reputable source. Ideally calves should be three to four weeks of age, but they should be a minimum of two weeks old when purchased onto beef farms. The purchased calf should be at least 50 kg when moved to their destination farm. Keep the number of source farms to a minimum to reduce the disease risk being brought on to your farm.

Herd information

The more information you can gather about the herd health status of the source farm, the better. Important details include colostrum management practices and the milk feeding regime used on the birth farm.

It is also valuable to know the vaccination programme in place (particularly for scour and respiratory diseases), and any history of disease on the dairy farm. Additionally, information such as the calf's Commercial Beef Value (CBV), which reflects the beef genetic merit of both the sire and dam and estimates the calf's profit potential in a finishing system, should be reviewed carefully before making a purchase decision.

What to look for in a calf when purchasing?

Appearance

Avoid buying calves that appear dull or weak. Healthy calves should be bright, playful, and curious about their surroundings. There should be no signs of dehydration. Their coats should be shiny and in good condition, with good skin elasticity and no evidence of hair loss or injury.

Head

The calf should be alert and bright, with clear eyes that are not sunken. There should be no discharge from the nose or eyes. The ears should be upright and alert, with no drooping, and breathing should be easy, relaxed, and unlaboured.

Legs/feet

The calf should be sound on all four feet, with no signs of swollen joints or stiffness. It should stand easily and quickly, with a relaxed posture and have no signs of hunching.

General

Each calf should have a clean, dry tail with no signs of scouring. The navel should be dry, clean, and well-healed. Calves should be in good body condition and have an appropriate weight for their age. Older calves should be observed for rumination and show good rumen fill with no signs of bloat or any digestive disorders. Ensure a normal temperature of 38 – 39°C.

Transport

When transporting calves, try to keep travel distances as short as possible. Long journeys increase stress levels, which can weaken the calves' immunity and make them more vulnerable to disease. Always wash and disinfect the trailer before use, and bed it with plenty of clean straw. The trailer should be covered, with side openings for proper ventilation. Ensure the number of calves matches the trailer size to prevent overcrowding. Once the calves arrive on the home farm, unload them as soon as possible.

After arrival

Once calves arrive on the farm, they should be quietly and gently unloaded. They should be allowed to settle for a number of hours, after which they should be fed a minimum of two litres of an electrolyte solution to aid rehydration. Electrolytes replace water and minerals/salts that are lost during times of stress, and they also promote the absorption of nutrients from the intestines. Purchased calves should be isolated from resident calves for up to a week to reduce the risk of disease transfer.

Calf feeding

When the calves have settled, they should be fed enough milk or milk replacer to support their growth potential. They should be fed six litres (0.75 kg milk replacer, in two feeds per day) during their first month of life, after which, volume can be reduced to increase concentrate intake. Clean, fresh water should be available at all times. Straw can be provided in racks to help promote rumen development. A high-quality, palatable calf ration should be readily available each day *ad-libitum*.

Housing

As calves spend up to 80% of their time lying down, a clean, dry, warm bed is necessary. Ensure that plenty of straw is provided. Calves require up to 2.2 m² of space each. Ensure that there is adequate ventilation to remove bacteria, viruses, smells, etc., but allow for no draughts at calf level.

Summary

Having a well thought out calf purchasing plan in place from the outset and buying calves within the criteria of the plan should ensure higher quality healthier calves end up on your farm.

Grazing management to achieve dairy-beef cattle growth targets

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Summary

- When effective grassland management is practised, animal performance can be optimised from fewer concentrate and fertiliser inputs increasing farm profit
- Incorporating clover and herbs into efficiently managed pastures, can increase daily live weight gains for dairy-beef progeny

Introduction

Optimising grassland management is a vital strategy to achieve the desired levels of animal performance within dairy-beef systems. Nationally, there are a number of targets to reach in terms of lessening the environmental footprint of beef production (to reduce finishing age by three months) while adhering to factory carcass specifications from a predominately pasture-based diet. Thus, a number of targets must be met at pasture for dairy-beef steers and heifers in terms of animal growth. During the first grazing season, the target average daily gain (ADG) is 0.7 to 0.8 kg, during which calves should be offered high quality pasture. The target ADG for dairy-beef animals during the second grazing season is 0.9 kg from a grass-only diet. Farmers should aim to reach these targets at pasture, to maximise animal growth potential in a cost-effective manner. Combining high genetic merit animals, with legume-rich swards along with improved grazing management practices can create more efficient grass-based dairy-beef systems that will ultimately be more profitable and will have a reduced environmental impact.

Grazing management for dairy-beef systems

Dairy-beef systems with good grassland management are more labour and cost efficient. Good infrastructure (roads and paddocks) maximises grass utilisation. Each grazing group requires 10-12 paddocks that can each support a 48-hour grazing allocation. This ensures that animal intake is not restricted and offers flexibility in terms of grazing management during poor weather conditions and splitting paddocks for calves. An inadequate number of paddocks leads to increased residency time which reduces grass utilisation and DM production. Clover can also play an important role in efficient dairy-beef systems. Therefore, soil testing should be carried out regularly to ensure optimum soil fertility to maximise herbage production, response to N fertiliser and improve the persistence of perennial ryegrass and clover. A minimum of 20 grass measurements must be carried out each year. During the grazing season, animals should be monitored regularly to ensure animal performance is not hindered due to an internal parasite infection (weight recording and faecal egg counts). Post-weaning, calves should be turned out to pasture, where, for the first three weeks, they are offered 1-1.5 kg of concentrate/day, along with full time access to straw, to ease the transition to a grass-based diet. Calves should be offered high quality pasture, with a target pre-grazing herbage mass of 1,200 kg DM/ha initially, which can be increased up to 1,400-1,600 kg DM/ha when they acclimatise to grazing. Concentrate is reintroduced in the autumn, to complement the decline in grass nutritive value. From mid-September, to housing, 1.5 kg of concentrate/day per animal is offered to maintain energy intake and to extend the grazing season. Over the first winter period, a moderate growth rate of 0.6-0.7 kg/day is desired to maximise the compensatory growth potential of animals when returned to high quality pasture for a second grazing season. Typically, dairy-beef heifers and steers are turned out to pasture from mid-February to mid-March with an average farm cover of 600-700 kg DM/ha. It is vital that dairy-beef farmers aggressively

close area for first cut silage, targeting to close 45-55% of the farm area, to inflate grass demand with expected grass growth and to make sufficient high quality silage. During the mid-season period, pre-grazing cover needs to be maintained at 1,500-1,600 kg DM/ha and the target post-grazing sward height is ~5 cm to maintain sward quality and animal performance for calves and cattle. An 18 to 21 day rotation should be implemented and any surplus herbage should be removed as bales. Planning for spring begins during the previous autumn. In order to start building cover, demand should be reduced and rotation length should be extended by 1.5 days/week from August. The target closing average farm cover is 450-550 kg DM/ha on the 1st of December. Improving grassland management is one of the most cost-effective tools to improve the profitability and viability of dairy-beef production.

Johnstown Castle dairy-calf to beef study

A recent study was conducted at Teagasc, Johnstown Castle, to determine the interaction between pasture type and dairy-beef heifer physical performance. In 2021 and 2022, 105 and 108 beef × dairy heifer calves, respectively, were purchased at approximately 20 weeks of age and were assigned to one of three pasture treatments: 1) PRG-only, receiving 150 kg N/ha, 2) CLOVER (red and white clover), receiving 75 kg N/ha, and 3) MSS (PRG, red and white clover, plantain, and chicory) swards receiving 75 kg N/ha. When a post-grazing sward height of 5 cm was maintained across the three pasture treatments, heifers consuming the MSS and CLOVER herbage (with a sward clover content 21 and 22%, respectively), had greater lifetime growth compared with the PRG heifers (Table 1). During the 1st grazing season, calves consuming a MSS diet grew an additional 0.17 kg per day compared with the CLOVER and PRG diet. While during the 2nd grazing season, the yearling animals performed best on a grass-clover diet. Dairy-beef heifers consuming PRG, CLOVER and MSS achieved carcass weights of 243, 250, and 249 kg at 19.6, 19.2, and 19.2 months of age, respectively.

Table 1. *Effect of pasture treatment on live weight gain of dairy-beef heifers from pasture, managed on PRG-only swards (PRG), PRG plus red and white clover swards (CLOVER), and multispecies swards (MSS)*

ADG Period	Target	PRG	CLOVER	MSS
1st grazing season, kg	0.7-0.8	0.61	0.62	0.79
1st winter, kg	0.6-0.7	0.65	0.65	0.68
2nd grazing season, kg	0.9	0.81	0.92	0.87
Lifetime. kg	>0.7	0.74	0.78	0.79

Conclusion

When the correct grassland management strategies are implemented, dairy beef animals can achieve the desired level of animal performance from a grass-only diet. The incorporation of legumes and herbs into well managed swards can also improve the level of animal gain achieved from a grass-based dairy-beef production system, under a reduced chemical N regime. However, a >20% sward clover content must be maintained to achieve an animal and sward production benefit.

Performance of dairy-beef weanlings offered grass silage or red clover-grass silage during their first winter indoors

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Summary

- Targeting 0.6–0.7 kg ADG in dairy-beef weanlings during their first winter indoors maximises compensatory growth during the second grazing season
- Red clover-grass silage increased intake (+1.4 kg DM) and growth (+0.12 kg ADG) in steers despite lower digestibility (-9% DMD) than grass silage
- Red clover-grass silage should be offered to priority groups of growing animals who have lower opportunity for compensatory growth during a second grazing season

Introduction

Forage legumes like red clover play an important role in pasture-based beef systems by naturally fixing nitrogen from the atmosphere, thereby reducing the need for chemical fertilisers. This is particularly valuable as fertiliser and feed costs rise and environmental regulations tighten. Grassland with a high proportion of red clover (around 75% of dry matter) can fix over 200 kg of nitrogen per hectare annually. Cattle fed red clover-grass silage tend to have higher dry matter intake compared to those fed grass-only silage. Although red clover silage is less digestible overall, the digestible portion is broken down rapidly, allowing for faster passage through the digestive system and greater feed intake. However, while red clover appears to improve intake and performance, its impact on feed efficiency and compensatory growth in dairy-beef cattle is not well understood. This study aimed to compare the intake, growth, and compensatory growth of dairy-beef steers fed either perennial ryegrass or red clover-grass silage during their first winter indoors.

Dairy-beef weanling study

Silages were harvested in July 2022 from secondary regrowth after 58 days, wilted for 36 hours, chopped, and ensiled in separate walled silos for each treatment: perennial ryegrass (PRG) and red clover-grass (RCGS). Both swards contained similar ryegrass varieties, with RCGS also including a red clover variety. Perennial ryegrass swards received 208 kg/ha of chemical nitrogen annually, while RCGS received none. Perennial ryegrass and RCGS produced 15.6 and 19.3 tonnes of dry matter (DM) per hectare, respectively. Seventy-two spring-born dairy-beef steers (Angus x or Aubrac x Holstein Friesian) were split into two treatment groups (n=36 per group). Cattle were housed on slatted floors, offered ad-lib silage, and supplemented with 1.5 kg/day of a barley-based concentrate. Feed intake was recorded daily for 60 days using Calan gates, following a 35-day acclimation period. Weight was recorded every two weeks, and ultrasound scans measured fat and muscle depth at the start and end of winter. Silage and concentrate were sampled twice weekly for DM and nutrient content.

Results

Although both silages were harvested and managed the same way, PRG silage had higher digestibility but lower crude protein (CP) than RCGS. Despite lower digestibility, RCGS led to increased dry matter intake (DMI) and average daily gain (ADG), likely due to faster rumen passage and higher CP intake.

Table 1. *Red clover proportion and chemical composition of experimental silages*

Variables	PRG	RCGS	Concentrate
Red clover proportion	0.00	0.87	-
pH	3.6±0.09	4.1±0.09	-
Dry matter digestibility, g kg^{-1} DM	719±9.5	629±9.5	-
Digestible organic matter, g kg^{-1} DM	642±10.9	544±11.5	-
Organic matter digestibility, g kg^{-1} DM	704±10.7	602±10.7	-
Water soluble carbohydrates, g kg^{-1} DM	15.4±3.12	8.8±3.27	-
Ash, g kg^{-1} DM	91±1.9	93±1.9	58±1.2
Crude protein, g kg^{-1} DM	133±3.4	153±3.4	140±4.7
Neural detergent fibre, g kg^{-1} DM	412±32.4	458±32.4	152±6.6
Acid detergent fibre, g kg^{-1} DM	319±7.2	335±7.2	48±1.5

Red clover-grass steers showed better winter growth performance, gaining more weight and consuming more feed. However, this came with reduced feed efficiency, as residual feed intake (RFI) was 0.29 kg DM/day greater, raising questions about the cost-effectiveness of the additional gain.

Table 2. *Feed intake, feed efficiency and growth characteristics per silage treatment*

	PRG	RCGS	s.e.	P-value
No. of animals	36	36	-	-
1st winter indoors				
Dry matter intake, kg DM d^{-1}	6.2	7.6	0.126	0.001
Residual feed intake, kg DM d^{-1}	-0.14	0.15	0.073	0.001
Initial liveweight, kg	286	286	3.7	0.104
Final liveweight, kg	337	346	3.8	0.079
Average daily gain, kg d^{-1}	0.56	0.68	0.035	0.021
2nd grazing season				
Initial liveweight, kg	339	346	3.5	0.114
Final liveweight, kg	494	493	5.0	0.929
Average daily gain, kg d^{-1}	0.95	0.91	0.02	0.135

By the end of winter, RCGS steers were 9 kg heavier, though this difference was not statistically significant. During the following grazing season, PRG steers showed stronger compensatory growth and caught up in weight, resulting in no final difference between groups. PRG steers had a compensatory growth index of 1.0, indicating efficient recovery after moderate winter gains. These findings suggest that red clover silage could support good winter growth even with reduced or no concentrate feeding, but the overall economic return needs further evaluation.

Conclusion

Despite lower digestibility of RCGS, it maintains higher animal performance than PRG, although reducing feed efficiency. This demonstrates the opportunity for RCGS in beef systems to reduce reliance on inorganic N and concentrate, creating economic and environmental benefits. However, RCGS silages should be targeted towards priority animal groups, with limited compensatory growth opportunity and who can fully avail of increased intake and growth potential.

Finishing options for dairy-beef steers and heifers

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Summary

- High CBV early-maturing animals are suitable for finishing during their second grazing season, provided they reach sufficient liveweight targets by late summer
- Late-maturing or less-developed animals are better suited to indoor finishing, where their higher potential for lean growth allows for greater carcass gains

Choosing a dairy-beef system for your farm

Selecting a dairy-beef production system involves considering several key factors, including land availability, labour resources, facilities, and desired work-life balance. The financial return from your most limiting resource, typically land, should guide the evaluation of your chosen system. As such, net margin per hectare (ha) is commonly used as a performance metric. To maximise profit per hectare, farmers often increase stocking rates and aim to finish animals at a younger age. This approach supports high beef output and requires careful animal and grassland management. However, in systems where land and facility constraints are less significant—and where producers prioritise work-life balance, lower stocking densities and finishing cattle later, during a third grazing season, can still offer a strong return on labour investment.

Currently, research at Teagasc dairy-beef farms in Grange and Johnstown Castle is focusing on both early and late-maturing dairy-beef steers and heifers. The early-maturing breeds being studied are Angus (AA) and Hereford (HE), while Limousin (LM) and Belgian Blue (BB) represent the late-maturing breeds. These four breeds are the most commonly used beef sires on Irish dairy cows. Their differing maturities, combined with gender variation, provide a range of finishing options and help reduce the seasonality of beef supply from spring-born dairy-beef cattle. In addition to breed maturity and gender, liveweight and body condition also play a vital role in determining the most efficient finishing strategy. The goal is to maximise the use of forage to support high carcass weights at younger slaughter ages.

Tables 1 and 2 present the liveweight performance of spring 2024-born dairy-beef steers and heifers enrolled in the Teagasc research programs at Grange and Johnstown Castle, respectively.

Table 1. *2024-born dairy-beef steer liveweight performance (Grange)*

Breed	DOB	CBV (€)	Arrival age (days)	Arrival weight (kg)	ADG (kg)				Current weight (6 May)
					Rearing	1st summer	1st winter	2nd summer (YTD)	
AA	22 Feb	95	25	57	0.56	0.81	0.64	0.90	380
HE	16 Feb	81	22	54	0.72	0.77	0.63	0.88	378
BB	14 Feb	157	23	62	0.77	0.79	0.58	0.80	381
LM	25 Feb	157	26	58	0.65	0.80	0.65	0.80	373

Table 2. *2024-born dairy-beef heifer liveweight performance (Johnstown castle)*

Breed	DOB	CBV (€)	Arrival age (days)	Arrival weight (kg)	ADG (kg)				Current weight (9 May)
					Rearing	1st summer	1st winter	2nd summer (YTD)	
AA	16 Feb	99	27	53	0.71	0.64	0.70	1.09	341
HE	17 Feb	75	20	50	0.70	0.64	0.72	1.00	339
BB	13 Feb	156	23	55	0.70	0.62	0.63	1.14	335
LM	6 Feb	150	26	52	0.69	0.58	0.55	1.06	331

What are the finishing options for these cattle in autumn/winter?

Finishing early-maturing animals at grass during their second grazing season can be a highly efficient strategy, particularly for well-developed heifers and steers by late summer. This approach offers several advantages, including freeing up winter housing for younger stock, reducing feed costs, and improving overall farm efficiency. Key to its success are strong lifetime performance, sufficient liveweight at the start of the finishing period, and a short, targeted meal-feeding phase, typically lasting six to eight weeks from mid-August to mid-September. Animals which best suit this system are of high CBV and are born early in spring. Consistent drafting of animals to meet market specifications is also essential to ensure optimum returns.

Early-maturing heifers	Early-maturing steers
• Start weight: ≥450 kg	• Start weight: ≥490 kg
• Meal feeding: 3 kg/day	• Meal feeding: 4 kg/day
• ADG: 0.9–1.0 kg/day	• ADG: 1.1 kg/day
• Slaughter weight: 520–525 kg	• Slaughter weight: 550-620 kg
• Expected carcass: 255 kg	• Expected carcass: 280-320 kg

Less developed early-maturing animals, either due to limited genetic potential or being born late in spring, are often better suited to continued development at pasture, with finishing delayed until they reach target weights. These animals can then be finished indoors more efficiently. Advanced late-maturing heifers, when appropriately supplemented, may be finished at grass under a similar regime to that used for early-maturing steers during their second grazing season. However, they are more commonly finished indoors at 22–23 months of age using a conventional system, such as the one outlined below. Indoor finishing is particularly suitable for late-maturing steers and heifers, as these animals have a greater capacity for lean tissue growth. This allows them to respond better to high-energy finishing diets, resulting in improved feed conversion efficiency and increased carcass weight and conformation.

Late-maturing heifers	Late-maturing steers
• Start weight: ≥480 kg	• Start weight: ≥490 kg
• Meal feeding: 4 kg/day	• Meal feeding: 5 kg/day
• ADG: 0.9–1.0 kg/day	• ADG: 1.1 kg/day
• Slaughter weight: 550-600 kg	• Slaughter weight: 580-630 kg
• Expected carcass: 280-310 kg	• Expected carcass: 300-340 kg

Dairy cull cows – sale strategy considerations

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Summary

- Opportunities exist to improve market value through late lactation milk sales and meeting market specifications
- There is a higher likelihood of cows meeting target market specification when both BCS and liveweight are used in combination
- Optimum culling policy is farm-specific, and should take account of resources such as feed, slurry storage and labour
- The implications for annual nitrates calculations and banding should be considered before deciding culling policy

Introduction

Dairy cull cow sales annually stand at 280,000 (CSO) head. Although dairy cull cow sales are a relatively small contributor to overall farm net margin, opportunities exist to add value to cull cows, including through higher late lactation milk sales and increasing the percentage of animals that meet market carcass specifications thereby maximising beef price per kg carcass sold. Nonetheless, these opportunities are very much farm-specific and decisions around the timing of dairy cull cow sale should take cognisance of direct and overhead costs, farm facilities, labour and the implications for annual nitrates and banding calculations.

Target market specification

Research carried out outlined the percentage of dairy cull cows that met target market specification as BCS increases across various cow liveweight categories (Table 1). For example, an extra 30% of cows in the 550-620 kg liveweight category achieved target specification (>270 kg carcass, fat score ≥ 3-, carcass conformation ≥ P+) at BCS of ≥ 3.5 vs ≤ 3.0. The price paid for in-spec cows in January 2025 was €5.10 per kg carcass weight. At the same time, cows that failed to meet market spec ranged from €2.60 - €4.60 per kg of carcass, dependent on weight, fat score and conformation. Therefore, the difference in meeting target specification was on average worth an extra €1.50 per kg of carcass weight and an additional €405 in carcass value.

Table 1. *Percentage of Friesian cows which achieved target spec at various combinations of live weight and BCS*

BCS (5-point scale)	Live weight (kg)		
	< 550	550 – 620	> 620
≤ 3.0	2%	11%	35%
3.25	20%	32%	44%
≥ 3.5	29%	41%	40%

What should farmers consider when deciding a cull cow strategy?

Common sale options for spring calving cull cows are to: 1) sell in October during the last rotation and prior to housing; 2) sell in December at the point of dry off; and 3) dry off in December and finish to target market specifications. The optimal decision on the timing of sale will depend on a number of farm-specific factors:

Projected financial returns

Dairy cull cow sales are a relatively small contributor to overall farm output standing at 8.3% and 7.6% of total dairy gross output for 2023 and 2024, respectively, and with average cull cow values at €1,003 and €1,106 for 2023 and 2024, respectively (NFS). Nonetheless, opportunities exist to increase net margin through the correct timing of cull cow sales. For highly stocked farms, the most profitable outcome will be to sell the cull cows in October to improve the feed budget situation, whereas it may be better to milk these cows through to dry off and sell in mid-December on lower stocked farms. Projected gains in additional milk revenue and cull cow sale value should be weighed against additional feed costs, overheads and labour requirements.

Feed quantity and quality

Consider the total winter feed budget and the quality of silage in the yard, which should include a 20% reserve. Farms facing feed shortages must evaluate the cost-effectiveness of keeping cows versus purchasing additional feed, with a focus on securing reliable feed supplies. If additional silage is needed, careful consideration should be given to its quality, as poor-quality silage will require increased supplementation.

Current animal performance

Early culling decisions should prioritize removal of high somatic cell count (SCC) cows, older/infirm cows marked for culling, or low milk production animals (i.e. where daily feed plus overhead cost exceeds daily milk solids value). Cull cows with low SCC and good milk production can be retained for longer to maximize milk revenue; these animals will efficiently gain BCS on a good quality diet, which will enhance their marketability at point of culling.

Housing facilities

Retaining cull cows over winter increases the slurry storage capacity required, e.g. 10 cull cows retained over a 4-month period will produce an estimated 64 cubic metres of slurry. It is essential to assess whether the existing slurry storage infrastructure is sufficient. Additionally, ensure there is adequate cubicle and feed space to accommodate the cull animals, factoring in the cubicle space requirements of the in-calf heifer group.

Labour availability

Retaining cull cows will increase labour demands, reducing the number of days at grass and increasing the workload related to feeding silage, cleaning cubicles, and maintaining the herd.

Nitrates

Farms must consider the impact of culling strategy on their nitrates situation. In order to stay within regulatory limits for total organic N, it may necessitate culling cows earlier in the year. Where a herd average milk yield is approaching the threshold limit for band three production levels (>6,500kg), and is also approaching the upper organic N limit per ha, the potential impact of selling cull cows early must be considered. Retaining up to 16% of the herd as dry cull cows or three months can reduce annual average yield by 4-5%, which may have the effect of moving the herd into a lower yield band. However, these cull animals also contribute to total organic N production, which limits the scale of potential yield reduction to the 4-5% level. All culling options should be made with careful consideration of the impact on the farms annual nitrogen production, to ensure compliance with environmental regulations.