The ICBF Terminal Index

driving profits in a finishing system

Background

In Ireland, in excess of 65% of the cattle born to a Beef sire are moved to another holding before they reach one year old. So in the vast majority of cases the farmer who finishes the beef animal is not the farmer who bred that animal. The specialist finisher has to make a judgement call on what animals to purchase, taking into account some selection criteria such as their health status, feed levels pre sale, suitability for finishing and numbers of movements.

All of this is done with the intention of purchasing the potentially most profitable animal for a finishing system. So the finisher has a lot of variables to take into account and must make a decision to purchase or not in a very short period of time.

Genetics

However, up to now, the one variable that the finisher had no way of knowing was what an animal's natural genetic ability to be finished was. E.g. 2 identical animals are born on the same day, fed the same and then finished & killed on the same day. 1 animal turns out to be far more profitable than the other one – that difference is genetic.

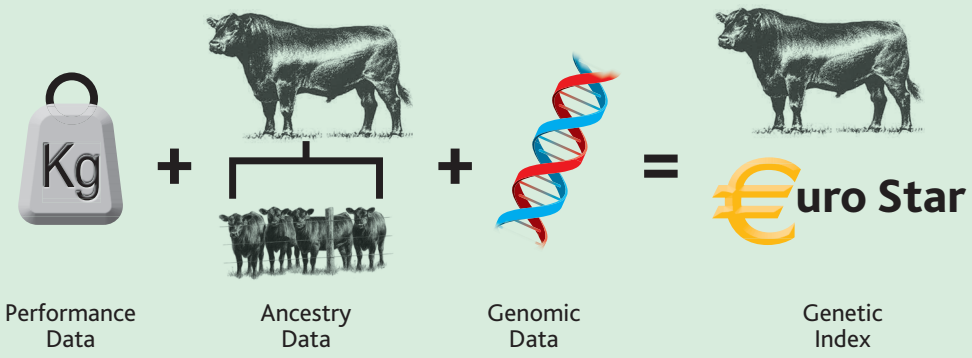
If the finisher knew this information before committing to buy, it would be very beneficial to him because the purchase price of the store/weanling bull for a finishing system can account for up to 70% of the direct costs of production! So it is critical for the viability of the system that the finisher purchases the most profitable animals, with the genetics for finishing and not be driving up feed bills trying to finish animals that are not bred to be finished.

Also, even if this information is not available at the time of sale, knowing the Terminal indexes of your cattle when you get them home is a tool that can be used to your advantage in terms of grouping cattle properly for feeding regimes, and finishing periods.

Terminal Index

The genetic merit rating that ICBF uses to describe an animal's genetic ability to be finished is the 'Terminal Index'. It is specifically designed to identify the most profitable animals that are intended for slaughter.

ICBF is able to do this by identifying the bloodlines in its database that repeatedly produce animals that grow quicker, finish earlier and leave better carcasses than other animals. It also analyses an animal's DNA (Genomics) to improve the accuracy of the index rating. Finally, the animal's index rating is also expressed with €uro-Stars to make them visually easier to follow (5 being best and 1 being worst).



Trait	Goal	Relative wt
Calving	Less	26%
Feed Intake	Less	16%
Carcass wt (for age)	More	56%
Docility	More	2%

Table 1: Overall trait makeup and weightings for the Terminal Index

A photo of the typical type of animal's on this Finisher's farm in Co.Kildare.

On-Farm Validation

We can legitimately ask the question;

Is the Terminal index currently identifying the most profitable animals for a finishing system operated at farm level?

It is essential to test the system at farm level and to demonstrate locally the relevance of the index. **To answer this question, the slaughter data for a beef finisher from Kildare who purchases all of the 450 cattle he finishes on the open market, was analysed.** The data presented here is based on the cattle slaughtered in the twelve months from April 2016 to April 2017, with complete purchase and slaughter data as well as having a Terminal €uro-star value allocated.

If we divide up the lifetime of the animals into two phases then the advantages of the 4&5 star animals over the 1&2 star animals becomes very evident:

Phase 1 This is birth to point of purchase by finisher.

Phase 2 This is the period on the finishing farm.

Phase 1

From birth to purchase by Finisher

The data for phase 1 is presented in the table below, showing both animal performance and economic metric comparisons for the 1&2 star and the 4&5 star animals for the period from birth to when the finisher purchased them.

Comparison of 4 & 5 v 1 & 2 star animals from birth to when the finisher purchased them			
Comparison Criteria	€uro-Star Ratings		Difference
	★★★★& ★★★★★	★ & ★★	★★★★& ★★★★★ V ★& ★★
Number of Animals	37	108	
Purchase Weight (Kgs)	441 kgs	444 kgs	-3kgs
Purchase Price (€)	€1,077	€1,061	+€16
Purchase Price (€/kg)	€2.44/kg	€2.39/kg	+5 cent/kg
Age at Purchase (days)	333 days	371 days	**-38 days**
Daily liveweight gain to purchase (kg/day)	1.20 kg/day	1.08 kg/day	**+0.12 (11%)**

Table 2 Comparison of 4&5 v 1&2 star animals from birth to when the finisher purchased them.

Summary of differences between 1&2 v 4&5 star animals from birth to purchase	
Purchase Weight (Kgs)	There was essentially **no real difference** in liveweight at purchase, between one, two and four, five star animals.
Purchase Price (€)	Also, the **price paid per kg was the same** for both groups of cattle. As the cattle were purchased on visual assessment, and deemed of similar quality, it is not surprising that the purchase price is the same for both groups.
Age at Purchase (days)	Differences between the two groups begin to emerge when we look at the liveweight metrics at purchase. **The 4&5* cattle were 38 days younger at the time of purchase, but had similar liveweight to the 1&2 star group.**
Daily liveweight gain to purchase (kg/day)	When the daily liveweight gain from birth to purchase is calculated, **we see clear differences of 11% in favour of the four and five star cattle.** This performance difference is available to the breeder who produced the better cattle, in that they reached sale weight 38 days sooner than if they were rated with 1 or 2 stars. This is a significant saving in feed costs as the animals were sold on average as yearlings, and are likely to be sold out of the sheds, the highest cost period for all cattle farmers.

Phase 2

Period on the Finishing Farm

So the 4&5* animals had better growth rates up to the point of sale to the finisher, so how did these animals perform relative to their 1&2* comrades on the finishing farm?

In Table 3 below, some of the key issues of interest on the finisher farm are shown

Comparison of 4 & 5 v 1 & 2 star animals from birth to when the finisher purchased them			
Comparison Criteria	€uro-Star Ratings		Difference
	★★★★& ★★★★★	★ & ★★	★★★★& ★★★★★ V ★& ★★
Number of Animals	37	108	
Carcass Weight (kgs)	426 kgs	383 kgs	**+43kgs**
Age at Slaughter (days)	559 days	581 days	**-22 days**
Lifetime Carcass Gain (kg/day)	0.72 kg/day	0.62 kg/day	**+16%**

Table 3 Comparison of 4&5 v 1&2 star animals for their period on the Finisher's farm.

Summary of differences between 1&2 v 4&5 star animals on the Finisher farm	
Carcass Weight (Kgs)	There was no real difference in the liveweight of the 2 groups of animals when they were bought by the finisher however **the 4&5* cattle produced carcasses which were on average 43kg heavier.**
Age at Slaughter (days)	**The 4&5* cattle were 22 days younger at slaughter than the 1&2 star cattle.** The reduced days to slaughter is very significant in a bull beef system with cattle on ad-lib concentrates clocking up daily feed costs in excess of €3/head.
Lifetime Carcass Gain (kg/day)	If 25 kgs is deducted from the final carcass weight of all the cattle to account for calf carcass weight, then an estimated carcass gain per day can be calculated. When this is done **we can see that the 4&5* cattle had a better average daily carcass gain of 0.72 versus 0.62 for the 1&2* group.** This is an extra 16% daily gain which is of great relevance bearing in mind the tight margins in finishing systems.

Overall Financial Figures

The issue that is of most concern to finishers is the bottom line i.e. was there any differences between the groups in financial terms. In table 4 the overall slaughter value per head of the two groups is shown.

Comparison of 4&5 v 1&2 star animals for finishing in overall financial terms			
Comparison Criteria	€uro-Star Ratings		Difference
	★★★★& ★★★★★	★ & ★★	★★★★& ★★★★★ V ★& ★★
Number of Animals	37	108	
Carcass Value (€)	€1,650	€1,506	**+€144/head**
Gain in Value for Finisher	€2.95	€2.37	**+24%**

Table 4 Comparison of 4&5 v 1&2 star animals for finishing in overall financial terms.

Carcass Value(€)	There are clear differences between the two groups in carcass value, with the 4&5* cattle producing a carcass worth on average €144 more than their 1&2* comrades. Or in overall terms – **this equates to the group of 4&5 star animals leaving €5,328 more than the 1&2 star animals.**
Gain in Value for Finisher	If we look at the gain in value per day on the finishing farm (carcass value-purchase price/ days on finishing farm) **the 4&5 star outperformed the 1&2 star cattle by a margin of 24% (€2.95 v €2.37).**

Feed Conversion Efficiency

One very significant trait that cannot be quantified is the better feed conversion efficiency of the cattle with the higher terminal indices, measured as kgs of feed to produce kg of carcass. Recent figures from the ICBF Tully Beef Performance Test Centre, where individual animal feed intake is measured, shows great differences in feed intake per kg gain between 1* and 5* cattle. The difference over 100 days ad-lib feeding was €85 in favour of the 5* cattle.

Feed conversion efficiency contributes to 16% of the Terminal Index. No matter how good a judge of cattle a buyer is they will not identify this critical trait by looking at an animal. The Terminal Index identifies the many important traits that are not visible to the eye, but are essential to making a margin from finishing cattle.

'Feed Conversion Efficiency' data is electronically collected by ICBF on all animals in Tully

4&5 Star Terminal Index Sires

	AI Bull Details			Terminal Index			Carcass Performance		
	AI Code	Name	Breed	Index	€uro-Stars (Across Breed)	Rel%	Progeny Carcass Records	Compared to Herdmates	
								Days to Slaughter	Carcass Weight
	RGG	Giga du Bois Remont	BB	€188	★★★ ★★	90%	385	-32 days	+13Kgs
	FSZ	Fiston	CH	€154	★★★ ★★	95%	3265	-35 days	+5Kgs
	HZJ	Lisnagre Hansome	CH	€148	★★★ ★★	91%	379	-47 days	+11Kgs
	LGL	Lisnagre Elite	CH	€128	★★★ ★★	96%	12,798	-15 days	+10Kgs
	OGN	Gino	LM	€114	★★ ★★	89%	157	-1 day	+9Kgs

Table 5 A sample of some of the Sires & Grandsires of the 4&5 star cattle in this analysis.

When the AI Sires and Stockbulls that sired the 4&5 Star cattle in this analysis are looked at more closely, it is clear as to how these 4&5 star cattle got their advantage in the finishing period. In the table above, their Terminal index figures are displayed, but so are the figures which show how all of their progeny have performed to-date in comparison to their herdmates, in herds all over the country.

For example: the Charolais bull 'HZJ' has sired 379 cattle to-date which have been slaughtered. They were finished on average 47 days quicker than the other cattle that were finished alongside them (Herdmates) and also had carcasses that were on average, 11 kgs heavier.

Conclusion

The daily increase in value on the finishing farm is a critical issue for profitability, the aim being to put on the maximum amount of value over the shortest period at least cost. On intensive finishing farms with the cattle spending 100 days on a store diet or at grass followed by 100 days indoors on ad-lib concentrate feed, direct costs per can run as high as €1.65/head.

Every day that the animal spends on the farm is costing the finisher a lot of money, and the costs really rocket when the animals are turned indoors for the last 100 days of intensive feeding. **Cattle with higher Terminal Index values however have significantly higher daily liveweight gains, resulting in less days to slaughter and significantly reduced costs to the farmer, both breeder and finisher.**

So in conclusion, from the performance on this commercial farm it is clear that the Terminal Index has a lot to offer the farmer who finishes cattle. The system has a level of predictability that is robust when applied at commercial farm level. **From the data in this analysis it is clear that without this information farmers end up despite their best efforts buying some cattle that lose them money alongside cattle that have the genetic potential to make a profit.**

Indeed we can clearly see the cattle ICBF predicted to be more profitable are performing in line with predictions at farm level.

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This paper was presented by Christy Watson at the IGA Beef Conference & Farm Walk that was held on the 21st of June 2017, in the Headfort Arms Hotel Kells and afterwards on the farm of Tom Halpin, Carlanstown, Co.Meath.

Bernard Ging, Irish Grassland Association President (2017), TJ Duffy MDS joint event sponsor, Liam Egan, Mullinahone Co-Op, joint event sponsor and Tom Halpin host farmer. More papers from the conference as well as information about the IGA and its schedule of events throughout the year can be found at www.irishgrassland.com.

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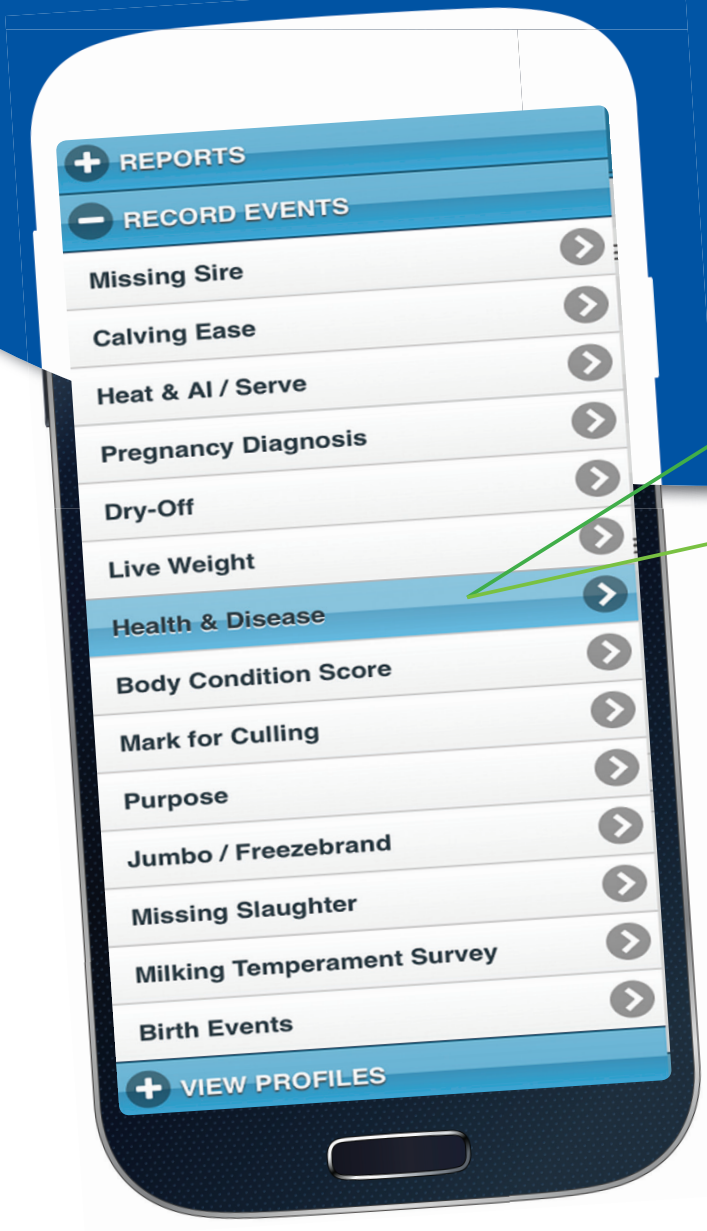

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