Beef Progeny Testing in Ireland

A New Era is Upon Us

Pat Donnellan ICBF

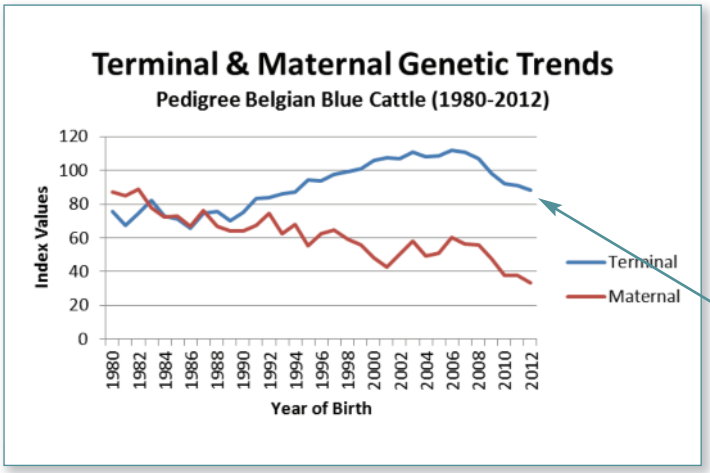
Beef Progeny Testing in Ireland

A new Era is upon us

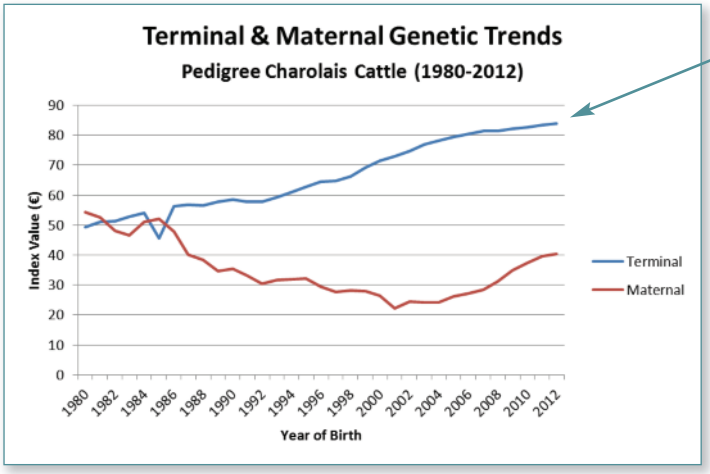
ICBF's overall responsibility is to improve the genetic merit of the National Herd. That means improving the genetics in the majority of Suckler Herds in Ireland i.e. Suckler Cows with better calving intervals, drystock with better feed efficiency and carcass grades etc. There are lots of methods, techniques & tools for helping us do this but the underlying logic as to how a country can do this is by:

- **Identifying** superior animals in the population who are producing more profitable stock than others.
- **Dispersing** these profitable bloodlines as widely as possible, into every suckler herd in Ireland.

Following are some examples of the trends that ICBF has to reverse in order for farmers to see a difference in the genetics of the pedigree bulls they are buying which in turn will affect our success in improving the genetics of the National herd:

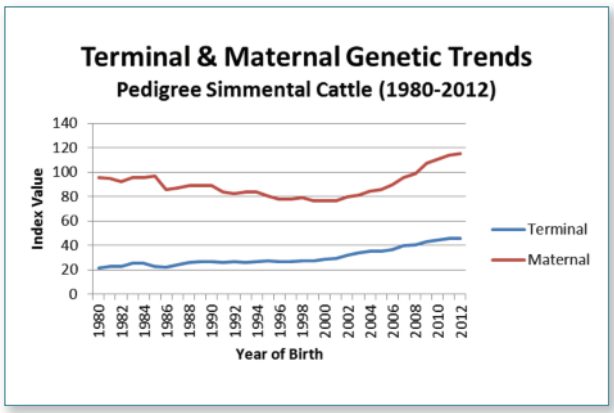


Graph 1: Pedigree Belgian Blue genetic trends (1980-2012)

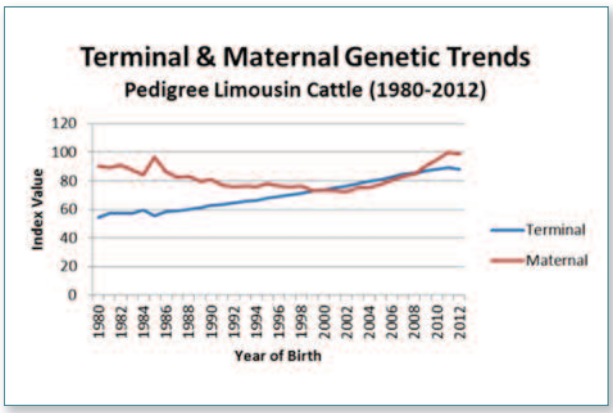


Graph 2: Pedigree Charolais genetic trends (1980-2012)

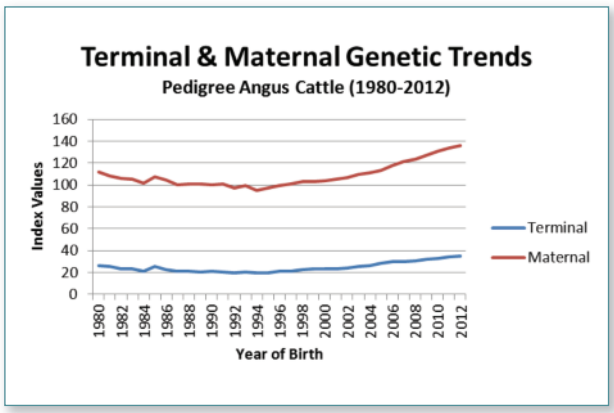
Terminal traits constantly improving over time at the cost of Maternal traits



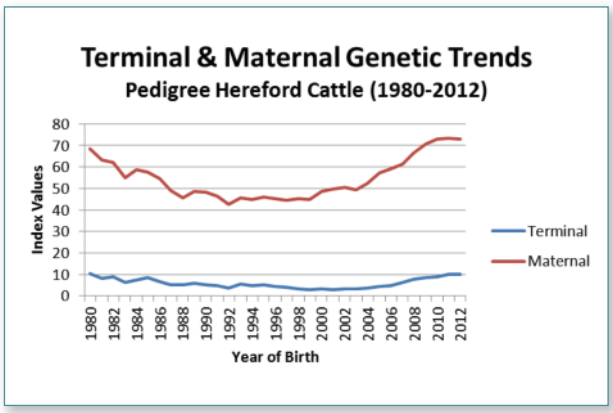
Graph 3: Pedigree Simmental genetic trends (1980-2012)



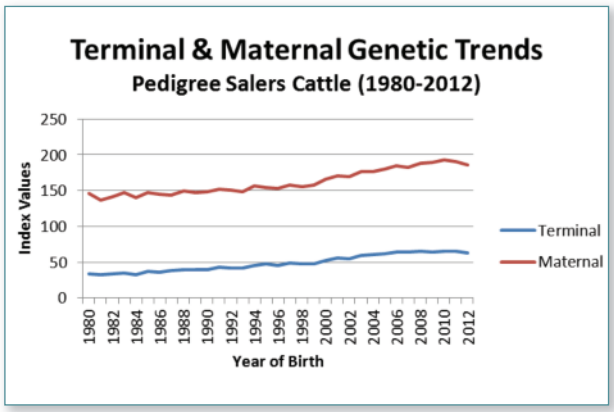
Graph 4: Pedigree Limousin genetic trends (1980-2012)



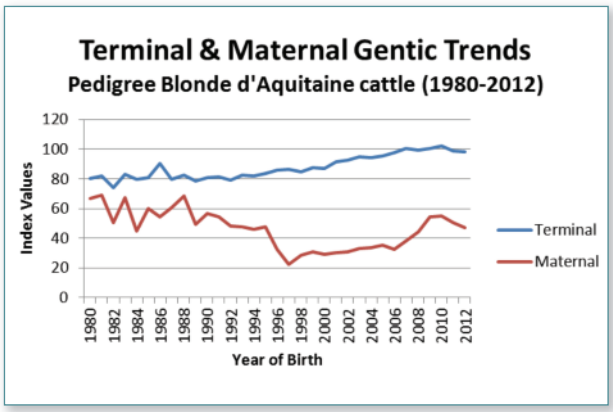
Graph 5: Pedigree Angus genetic trends (1980-2012)



Graph 6: Pedigree Hereford genetic trends (1980-2012)



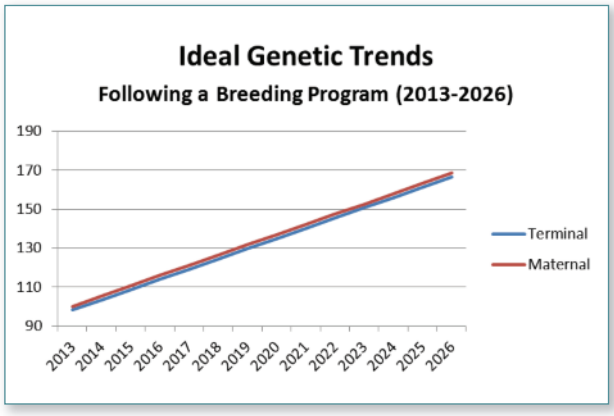
Graph 7: Pedigree Salers genetic trends (1980-2012)



Graph 8: Pedigree Blonde genetic trends (1980-2012)

The one standout similarity across nearly all of the breeds is the direction of the blue trendline for the Terminal Index. It has been consistently rising over the years as breeders continuously selected bulls whose progeny excelled for growth and carcass merit.

Focusing on one trait however came at a cost – illustrated by the red line which shows the Maternal performance (Milk & Fertility of daughters) over the same time period. This has generally disimproved over the same time period however is now thankfully starting to rise again as Breeders start to feel the effects of selecting too much on growth and carcass traits and are encountering milk & fertility problems in their replacement females.



Graph 9: The Ideal Genetic Trend that could be achieved through a structured Breeding Program

A graph similar to the one above is the type of graph that you would like to see for all breeds in the future i.e. Terminal & Maternal genes being improved in the national herd at a constant rate.

In order for a country to bring about such a change in the genetics of its National herd the first step is the establishment of a Beef Breeding Program. As mentioned earlier, there are 2 essential requirements that must be in place for a Beef Cattle Breeding Program to be successful:

1. **Beef Progeny Test program**
   Having a system that identifies and measures the performance of the progeny of Testbulls accurately & efficiently, underpins the confidence that can be put in the index figures that the bulls subsequently receive.

2. **Sourcing Beef Testbulls**
   Getting large numbers of the 'right' type of Beef Testbulls progeny tested each year is crucial. ICBF's interpretation of the 'right' type of bull is a bull with very high Maternal/Terminal indices, is free of genetic defects, has a DNA confirmed parentage and is of course structurally sound.

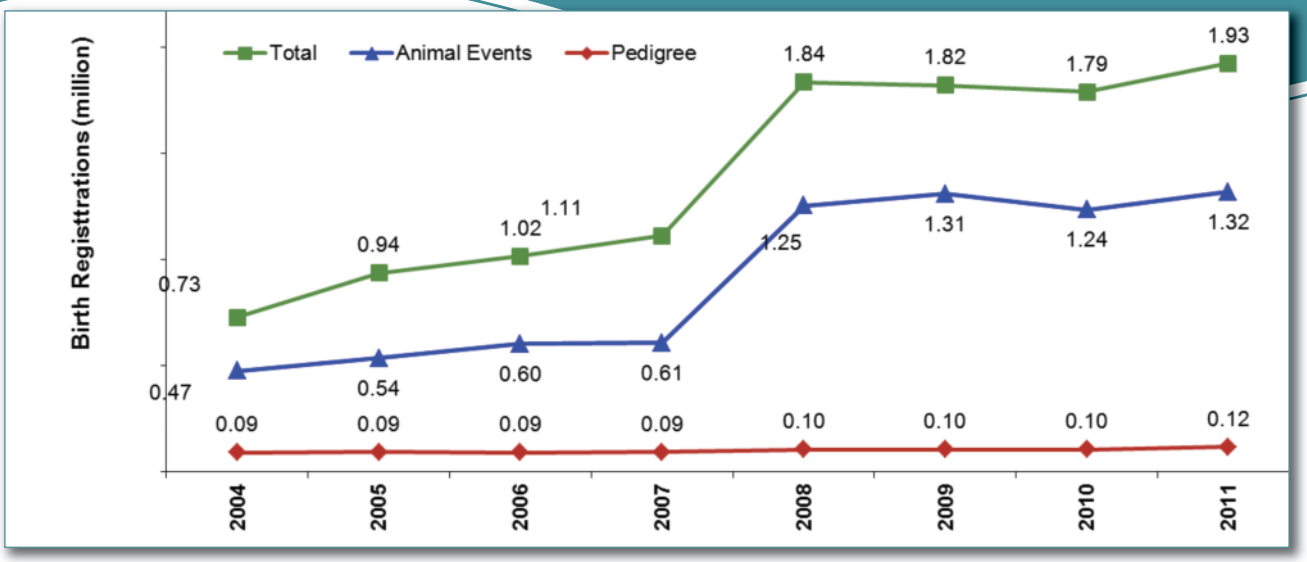
The structure of the progeny test program itself, how data is collected etc, was one of the first tasks taken on by ICBF shortly after its establishment in 2000. Now, 12 years later it is the second part of the equation – the selection of Beef Testbulls for AI that is now being progressed in quite a radical way – hence the title of this article, that a new era in Beef cattle breeding is truly upon us.

Beef Progeny Test Program

Beef Progeny Testing has been ongoing in Ireland for well over 50 years at this stage. For the vast majority of that time, the progeny testing of AI Sires was carried out exclusively by the various Irish AI Stations through what was called 'Centralised Progeny Testing'. Only young Beef Bulls that were purchased by AI Stations in Ireland were ever progeny tested.

The AI Stations purchased calves from their Beef Testbull's first crops of calves. They would rear them on their AI Station farms under uniform conditions (same feeding & management treatment for all), weigh them regularly and send them from there straight to the factory. The resulting liveweights and carcass grades were then all submitted to the Department of Agriculture, who ran the genetic evaluations and produced the bull proofs.

Calf Rearing & finishing of purchased AI Testbull Progeny at Dovea AI Centre (pre 2000)



Graph 10: Progress of the Animal Events animal recording system (2004-2011)

Shortly after ICBF was established in 2000, this all changed. A national database was created and an on-farm data recording system called 'Animal Events' was put in place. This meant that all farmers could contribute information on the progeny of a bull (calving, weights, gestation length etc).

The practice of AI Stations purchasing calves and rearing them to slaughter ceased. Instead, the progeny of Testbulls are left in the farms they are born in and are picked up by the Animal Events system, which all farmers can use to register their calves with.

Even if the progeny move to other herds go into marts or end up being slaughtered or exported, the ICBF database tracks their movements through the AIMS system and stores the relevant data i.e. mart weights, slaughter grades, survival rates etc.

The ICBF Animal Events system has recorded registration data on all Pedigree calves since 2004 and has been registering commercial calves since 2000. The number of farmers using the system has increased gradually over the years. The large increase in 2008 was due to the introduction of the Suckler Cow Welfare Scheme (SCWS).

Approximately 77,000 herds, with 1.8 million calvings, representing 90% of the entire Irish cattle herd, were participating in one or more aspects of the ICBF database by the end of 2010. Along with the registration data comes data on calving ease, Sire ID and much more.

Pictured above in 2004 is Willie John Kehoe with the first ever pedigree animal to be registered through the Animal Events system – 'Clifden Venus'. She was a pedigree registered Blonde d'Aquitaine heifer born on the 1st of January 2004. Also pictured is Willie's son Jim, proudly holding the ICBF Animal Events On-Farm recording Book.

There are many advantages from a genetic improvement point of view from having this on-farm data collection system in place instead of a centralized progeny test system, here are just a few:

1. Index Figures regularly updated

Under the Centralized progeny test system, each Testbull got one set of Index figures based solely on his purchased progeny out of dairy cows. Those figures would remain the same forever more with no new data ever being added.

However, under the new ICBF system a Bull is constantly adding more calves, more liveweights, and more progeny related data to his index figures at each evaluation run (carried out 3 times per annum). New progeny being constantly included ensures that the estimation of what a Bull's strengths & weaknesses are is getting more accurate over time.

2. Stockbulls & Foreign AI Sires included

The ICBF Animal Events recording system has also meant that all types of Beef Sires could have their progeny evaluated and not just those that are standing in Irish AI Stations. For the first time ever, Stockbulls & Foreign AI Sires could have their progeny evaluated, side by side with the progeny of Irish AI Sires.

Beef Progeny Test Bull Types (1952 - 2013)	
Period	**Type of Beef Bull progeny tested**
1952-2000	Young Beef Bull standing in an Irish AI Station
2000 - present	Imported semen of Foreign Bull (Proven or Test)
	Young Beef Bill standing in Irish AI Station

Table 1: Types of Beef Bulls eligible for progeny testing in Ireland (1952-2013)

3. Female traits evaluated

It was only male calves that were purchased for the old centralized progeny test program. The performance of the daughters of a bull (calving ability, milk & fertility etc) was not recorded. The 'Animal Events' system corrected this. The daughters of Beef Bulls in Ireland are tracked throughout their lives and a range of data is recorded on them which then allows ICBF to estimate the genetic merit of the sire for siring replacements for the suckler herd.

Sourcing Beef Testbulls

The sourcing of young Beef Bulls for AI has nearly always been carried out by the AI Companies. To-date there has been 3 main ways routes through which a Beef Testbull would be purchased by an AI Station:

1. **Imported**
   It is no surprise that a lot of young Pedigree Beef Bulls are imported into Ireland for use in AI given that the vast majority of beef breeds in use in Ireland are not native to these shores.

2. **Performance Tested at Tully**
   The Performance Test Centre at Tully, Co.Kildare took in young, nearly exclusively Irish bred pedigree bulls, and following a feeding period of a couple of months identified bulls that had excellent growth rates but who were also very efficient at converting the feed they ate into liveweight.

3. **Show / On-farm purchased Bulls**
   Of course a lot of Bulls were not imported but they did not go through Tully either. They were purchased on-farm, normally after a successful show career and were taken straight into the AI Station.

Taking the Hereford breed as an example, following are 3 bulls that were selected for AI through each of the above routes.

Imported - CH 3223 Visa ET 57X

'Visa' was purchased by the Dublin District Milk Board, now known as Progressive Genetics at the Sale of Mr Garth H. Cutler, Lacombe Alberta, Canada on November 6th 1988. Following is a copy of his sale catalogue page:

His Actual 198 day weight was 367Kgs and his average daily gain was 1.85Kg/day. His maternal sister (Lot 6) sold for $9100 in the same sale.

The sale's catalogue page, photographs & commentary on his bloodline is typical of the information that accompanies most imported Beef Testbulls. His career in AI is also typical of most Irish AI Sires who go on to become proven sires – they remain in AI until they stop producing semen.

He stood in the AI Station in Enfield until the mid 1990's. He was an extremely popular bull siring a huge amount of show winners and sale toppers. He crossed extremely well onto traditional Irish Hereford cows in particular and being an imported Canadian bull, his outcross appeal went down very well with the pedigree breeders here. When he stopped producing semen for AI he was released for natural use on-farm. He went to Denis Purdon's noted 'Lisnabin'pedigree Hereford Herd in Killucan, Co.Westmeath. He then returned to the AI Station again to try and get more semen collected but was then permanently released from AI. He was then jointly purchased by Stanley Heaslip, Glebe House, Carrickaboy, Co.Cavan & Harold Fitzell, Lislaughtin, Ballylongford, Co.Kerry. He spent the Autumn time in Cavan in Stanley's pedigree Hereford herd and then spent the remainder of the year down in Kerry covering the hereford cows in the 'Lislaughtin' herd.

After a great deal of deliberation we decided to include "Visa" in our sale offering. He is the largest framed calf out of our very good "Express X 79R" flush. This athletic, youthful calf shows excellent muscle expression and natural thickness. "Visa" is backed by two outstanding individuals. "Express" is one of the breed's biggest framed bulls - measuring 65" and weighing 3000 lbs. He was Reserve Champion at Denver in 1986 and was the '85-86 show bull of the year in the US. His offspring were a force in Denver in 1988 as a daughter was named heifer calf champion and a son, "All Pro", was bull calf champion and the Reserve Grand Champion Bull. We feel "Express" progeny have a great deal to offer the breed with their extra length of body and frame combined with a strong maternal background.

"79R" is playing an important role in our program. As an individual she is top notch. Presently measuring 58 1/2" she was Champion at the Alberta Junior show in 1983 with her mother, "83L", and again in '84 as a yearling heifer. In 1984 she was the Champion at the Stettler Fair and a class winner at the National Junior Show. Her dam, "83L", is in great demand as an embryo donor for breeders in Australia. We are using "79R's" first son, "Cando", heavily in our program with exciting results. "Visa" is a powerful calf with great credentials.

CL1 Express 3223 ET, the reserve grand champion bull, was shown by Colyer Herefords, Bruneau, Idaho.

Sire – CL1 Express 3223 ET

Dam – CH 073 Dominette 79R

Sire – CL1 Express 3223 ET

Dam with a half brother of 'Visa' called 'CH 481 Can Do 22U' who was retained as a Herdsire.

Visa at 18mths old in Enfield AI Station

Progeny of Visa with Hereford Breeder Stanley Heaslip

CH Visa 3223 57X out on-farm in Carrickaboy, Co.Cavan

Performance Tested – Bishophill General

In terms of being self sufficient and being able to produce our own Irish Beef Testbulls, a National Bull Performance Test Station was set up in 1973.

Callan Gates through which to feed the Bulls were put into Tully from the start so as to gauge how efficient each Bull was at converting the feed they were eating into liveweight. Ultrasonic measurements (Backfat & Eye Muscle) and liveweights were taken routinely on the Bulls. Feed intake, weight and several other measurements were painstakingly recorded on each bull using pen & paper through the 1970' & 80's. This information was then keyed into a computer from the early 1990's on and data is now recorded on cattle in Tully using an electronic handheld device.

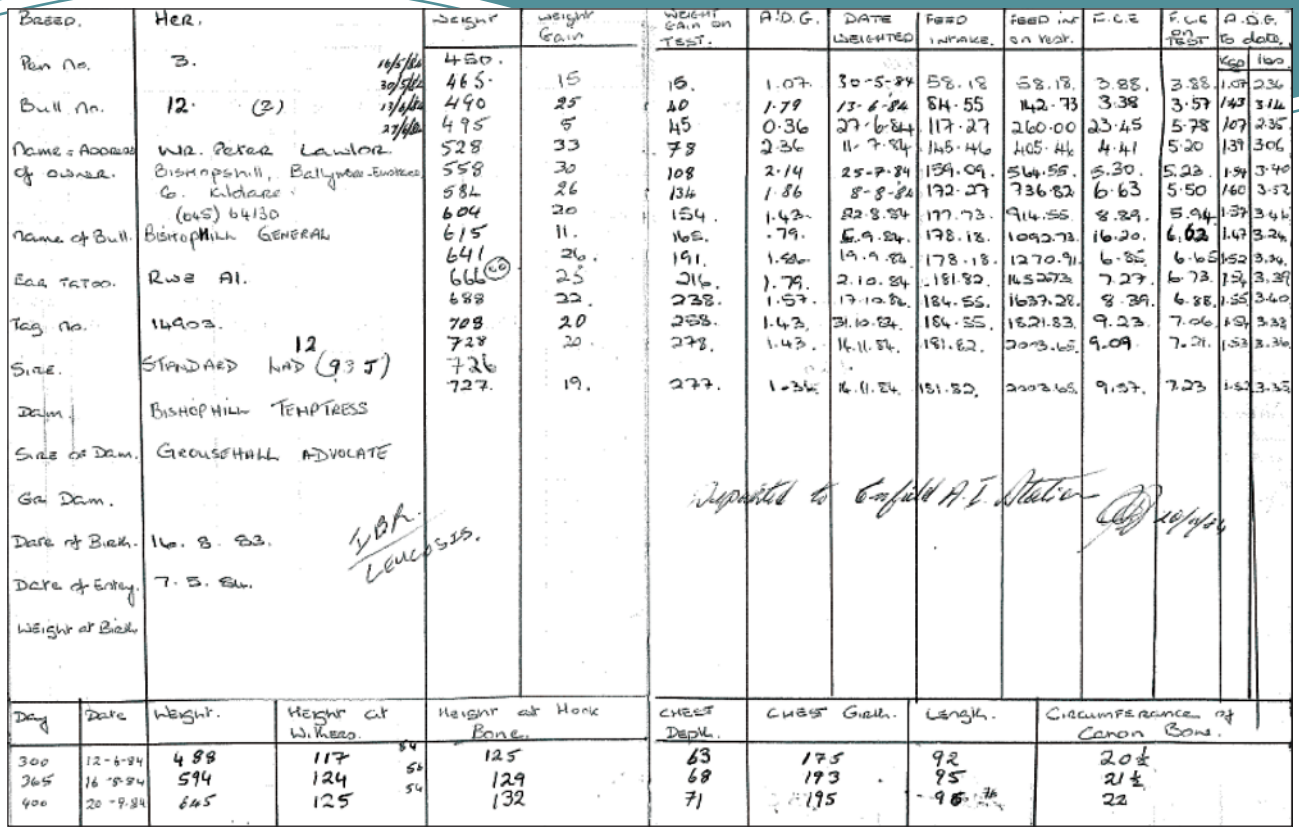
AI Stations would routinely purchase some of the top performing Bulls across all the breeds from Tully – many of whom went on to become very successful AI Sires. One such bull who is a classic example of what a Performance Test Centre was capable of doing i.e. identifying a superior individual in a breed thus allowing his genes to be disseminated into the National herd, was the Hereford Bull 'Bishophill General'.

Bred by Peter Lawlor, Ballymore Eustace, Co.Kildare he was performance tested at Tully in 1984, where he outperformed all his contemporaries including the Continental breeds. He weighed 656 Kgs at 410 days and had a daily liveweight gain of 1.6 Kgs. His final weight on test was 21% above breed average.

Bred by: Peter Lawlor
Ballymore Eustace
Co. Kildare

Born: 16 - 8 - 83

Following is a copy of the actual page from the Tully Ledger in which data was recorded on him throughout his 6 months at Tully. The data recorded is also reproduced underneath and underlines the level of detail in terms of individual animal measurements that was achieved at Tully.



Breed. Her.

Pen No. 3.

Bull No. 12. (2)

Name & Address of owner. Wm. Peter Lawlor. Bishopshill, Ballymore Eustace, Co. Kildare. (045) 64130

Name of Bull. Bishophill General

Ear Tatoo. RWE AI.

Tag No. 14903.

Sire. Standard Lad (93J) 12

Dam. Bishophill Temptress

Sire of Dam. Grousehall Advocate

Gr. Dam.

Date of Birth. 16. 8. 83.

Date of Entry. 7. 5. 84.

Weight at Birth

Weight	Weight Gain	Weight Gain on Test	A.D.G.	Date Weighed	Feed Intake	Feed Int on Test	F.C.E.	F.C.E on Test	A.D.G. To date Kgs	A.D.G. To date lbs
450.										
465.	15	15.	1.07	30-5-84	58.18	58.18.	3.88.	3.88	1.07	2.36
490	25	40	1.79	13-6-84	84.55	142.73	3.38	3.57	1.43	3.14
495	5	45	0.36	27-6-84	117.27	260.00	23.45	5.78	1.07	2.35
528	33	78	2.36	11-7-84	145.46	405.46	4.41	5.20	1.39	3.06
558	30	108	2.14	25-7-84	159.09.	564.55.	5.30.	5.23.	1.54	3.40
584	26	134	1.86	8-8-84	172.27	736.82	6.63	5.50	1.60	3.52
604	20	154	1.43.	22.8.84	177.73.	914.55	8.89.	5.94	1.57	3.46
615	11.	165.	.79.	5.9.84.	178.18.	1092.73.	16.20.	6.62	1.47	3.24
641	26.	191.	1.86.	19.9.84.	178.18.	1270.91.	6.85.	6.65	1.52	3.34.
666 (c)	25	216.	1.79.	2.10.84.	181.82.	1452.73.	7.27.	6.73.	1.54	3.39
688	22.	238.	1.57.	17.10.84.	184.55.	1637.28.	8.39.	6.88.	1.55	3.40
708	20	258.	1.43.	31.10.84.	184.55.	1821.83.	9.23.	7.06.	1.57	3.33
728	20.	278.	1.43.	14.11.84.	181.82.	2003.65.	9.09.	7.21.	1.53	3.36
726										
727.	19.	277.	1.36.	16.11.84.	181.82.	2003.65.	9.17.	7.23	1.53	3.33

Departed to Enfield A.I. Station 16/11/84

Day	Date	Weight.	Height at Withers.	Height at Hook Bone.	Chest Depth.	Chest Girth.	Length.	Circumference of Canon Bone.
300	12-6-84	488	117	125	63	175	92	20½
365	16-8-84	594	124	129	68	193	95	21½
400	20-9-84	645	125	132	71	195	96	22

Table 2: Copy of the actual data sheet from a Tully Ledger for 'Bishophill General'

		Weight	Weight Gain	Weight Gain on Test	A.D.G	Date Weighed	Feed Intake	Feed Int on Test	FCE	FCE on Test	A.D.G To date	
Breed	Her	450				16/05/1984					Kgs	lbs
Pen number	3	465	15	15	1.07	30/05/1984	58.18	58.18	3.88	3.88	1.07	2.36
Bull number	12	490	25	40	1.79	13/06/1984	84.55	142.73	3.38	3.57	1.43	3.14
Name & Address	Mr Peter Lawlor, Bishopshill,	495	5	45	0.36	27/06/1984	117.27	260.00	23.45	5.78	1.07	2.35
of Owner	Ballymore Eustace, Co.Kildare	528	33	78	2.36	11/07/1984	145.46	405.46	4.41	5.20	1.39	3.06
Name of Bull	Bishophill General	558	30	108	2.14	25/07/1984	159.09	564.55	5.30	5.23	1.54	3.40
Ear Tattoo	RWE AI	584	26	134	1.86	08/08/1984	172.27	736.82	6.63	5.50	1.60	3.52
Tag number	14903	604	20	154	1.43	22/08/1984	177.73	914.55	8.89	5.94	1.57	3.46
Sire	Standard Lad (93J)	615	11	165	0.79	05/09/1984	178.18	1092.73	16.20	6.02	1.47	3.24
Dam	Bishophill Temptress	641	26	191	1.86	19/09/1984	178.18	1270.91	6.85	6.65	1.52	3.34
Sire of Dam	Grousehall Advocate	666	25	216	1.79	02/10/1984	181.82	1452.73	7.27	6.73	1.54	3.39
Gr.Dam		688	22	238	1.57	17/10/1984	184.55	1637.28	8.39	6.88	1.55	3.40
Date of Birth	16/08/1983	708	20	258	1.43	31/10/1984	184.55	1821.83	9.23	7.06	1.54	3.38
Date of Entry	07/05/1984	728	20	278	1.43	14/11/1984	181.82	2003.65	9.09	7.21	1.53	3.36
Weight at Birth		Departed to Enfield AI Station 20/11/84										

Day	Date	Weight	Height at Withers	Height at Hook Bone	Chest Depth	Chest Girth	Length	Circumference of Canon Bone
300	12/06/1984	488	117	125	63	175	92	20.5
365	16/08/1984	594	124	129	68	193	95	21.5
400	20/09/1984	645	125	132	71	195	96	22

Table 3: Reproduced copy of the actual data sheet from a Tully Ledger for 'Bishophill General'

He was also purchased by the Dublin District Milk Board (now Progressive Genetics) and went on to become the most popular Hereford Sire in Ireland. In the pedigree context he sired numerous Supreme Champions at shows and sales all around Ireland and to this day is regarded as one of the greatest ever Hereford AI Bulls.

CLONE JUSTICE (CJT)

H.B. No.: QKE/J08/123 Born:22/10/91

***Sire*: CH VISA 57X (Imp)**

H.B. No.: 2365168 (CAN)

***Dam*: CLONE GEM (A.I.)**

H.B. No.: QKE/E6/119

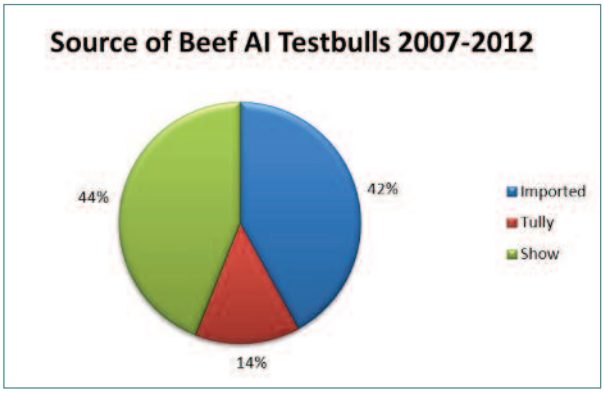
Bred by: J. Healy, Ballyragget, Kilkenny.

JUSTICE was first prizewinner at Waterford, Enniscorthy, Holycross, Clonmel, Tinahely, Cappamore, Tullow and Kilkenny. His mother CLONE GEM is a full sister to CLONE PRIDE the well known champion show cow. His grandmother CLONE VELVET was also a show champion. With FORTFARM JUDO, G.M. TAURUS and 93J in the dam's pedigree and the renowned CH VISA in the sire side, JUSTICE is the product of an exceptionally well balanced pedigree.

Show /On farm purchased Bull – Clone Justice

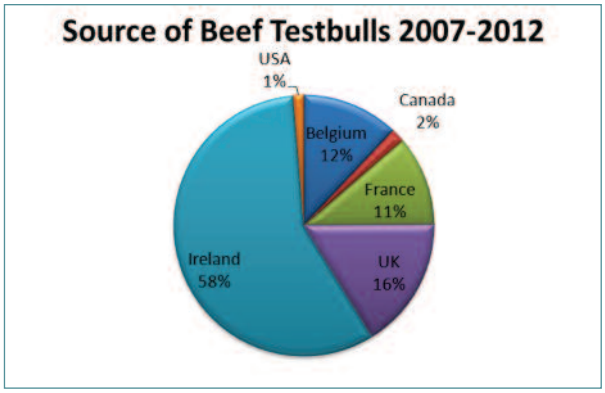
Of course, the most natural and logical way for a Bull to be selected for use in AI is purely based on how he looks. Countless numbers of Beef Bulls have been selected as Testbulls purely based on how successful they have been in the showring. Numerous Show champions have been purchased for top prices at sales by AI Stations. 'Clone Justice' above is a classic example of a Bull that was purchased for use in AI (by the same AI Station as the previous 2 bulls) on the back of an outstanding show career.

To put some figures on the above 3 categories of animals – following is an analysis of the last 5 years of Beef Testbulls:



Pie Chart 1: Proportion of Beef Testbulls that were imported, came through a Performance Test at Tully or were selected from shows or on-farm (2007-2012).

The pie-chart above shows the source of Beef Testbulls in Ireland from 2007 – 2012. There were 213 Pedigree Beef Bulls purchased for AI Progeny Testing in Ireland between 2007 & 2012. The purpose of this analysis is to show that only 14% (a little more than 1 in 10) of these bulls had come through Irelands National Bull Performance Test Centre which would have at least assessed each bull for growth and carcass traits. The majority of the Bulls were either imported or were generally bought based on their physical appearance (shows or on-farm etc) here in Ireland.

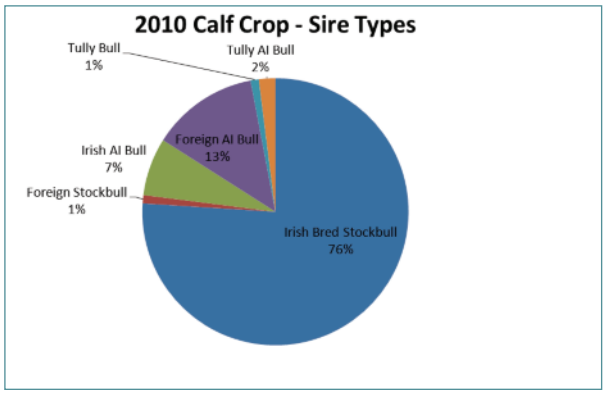


Pie Chart 2: Countries of origin of Beef Testbulls that went on progeny test 2007-2012.

Added to this is the complication that the imported Bulls came from 5 different countries – all with their own unique genetic evaluation system. So the index figures they were imported with are not always fully convertible to Irish equivalent figures (different traits recorded, no common ancestors in both countries etc).

Stockbulls

What also has to be taken into consideration is the overall effect that Beef AI bulls have on the national calf crop anyway which is very little when compared to the percentage of calves that Stockbulls are responsible for. For example, the pie chart below represents a sample of 350,00 beef calves born in Ireland in 2010.



Pie Chart 3: Types of sires for beef calves born in Ireland in 2010

The pie chart shows that:

- 76% of calves are sired by Stockbulls.
- 13% are sired by foreign AI Bulls.
- 7% are sired by Irish bred AI Bulls.
- 2% are sired by AI Bulls that have come through Tully.
- 1% are sired by Stockbulls that have come through Tully.
- 1% are sired by foreign Stockbulls.

As can be seen from this pie chart, the group of bulls that are having the biggest impact on the genetics of the National calf crop each year are Stockbulls. Therefore, in order for ICBF to influence the genetics of the National herd, reverse negative trends (as shown earlier) and improve the profitability of the cattle that farmers work with, the national beef breeding program must not only increase the number of desired bulls that go into AI and are progeny tested, but the best of these bulls must also be used as the sires of young Stockbulls, sold by pedigree breeders to commercial farmers every year.

AI Sires

AI usage in Pedigree herds is quite high with approximately 70% of pedigree calves sired by AI bulls every year so if the AI Sires being used by these pedigree breeders can be improved then we will start being in control of the genetic trend of the national herd.

Dr Sinead McParland from Teagasc Moorepark has carried out detailed analysis work on this very issue. Sinead looked at the % contribution of an individual's genes to six individual beef populations.

In the absence of a Breeding program which identifies even better bulls year after year, certain AI Sires can dominate a breed for several years, being the sires of many breeding females, Stockbulls for Pedigree herds and AI Sires themselves. So although they are now long gone, their imprint on the breed remains.

Following are the Sires who contributed the most to the genes of calves born in 2011 in their respective populations. Calves were included in a population if at least 87.5% of their breed fraction were for that population.

The numbers of calves analysed for each breed were:

- 10,374 Angus calves
- 1,268 Belgian Blue calves
- 36,211 Charolais calves
- 5,764 Hereford calves
- 37,164 Limousin calves
- 7,957 Simmental calves

Sunset Acres Bang

Empire d'Ochain

Doonally New

Standard Lad 93J

Mas du Clos

Siegfried

Influential Beef AI Sires

Brd	Code	Name	Sex	Year of Birth	% Contribution to 2011 born calves (Pedigree & Commercial calves >87.5% of that breed)	
					Individual Bull's Contribution	Total Contribution
AA	SUB	SUNSET ACRES BANG	M	1986	4.37%	16%
AA	LWF	LAWSONS FORD BAGATELLE Z094	M	2000	3.75%	
AA	JBN	G V JUMBO 17N	M	1982	2.69%	
AA	PER	PERRYVILLE ROSCOE 17N	M	1981	2.57%	
AA	HCL	HIGHLAND COLOSSAL	M	1973	2.43%	
BB	EZN	EMPIRE D'OCHAIN	M	2003	10.91%	26%
BB	S598	HEROS DU PEROY	M	2005	5.22%	
BB	GDY	GALOPEUR DES HAYONS	M	1984	3.68%	
BB	S152	TORRERO DU GRAND COURTY	M	1996	2.93%	
BB	BYU	BLAK 5075 BATY EPRAVE	M	2003	2.91%	
CH	CF52	DOONALLY NEW	M	1997	5.52%	18%
CH	PTE	PIRATE	M	1999	3.71%	
CH	HME	HERMES	M	1992	3.32%	
CH	IDU	INDURAIN	M	1993	2.84%	
CH	IVC	INVINCIBLE	M	1993	2.49%	
HE	SAD	STANDARD LAD 93J IMP CAN	M	1977	7.57%	28%
HE	BHG	BISHOPHILL GENERAL	M	1983	6.30%	
HE	CKVX	CH 3223 VISA ET 57X	M	1988	6.28%	
HE	CUV	CHURCHILL STORM V583	M	2000	3.79%	
HE	TIB	TRILLICK BEST	M	2001	3.72%	
LM	MUC	MAS DU CLO	M	1996	3.38%	13%
LM	DAU	DAUPHIN	M	1988	3.04%	
LM	ROX	ROCKY	M	2000	2.63%	
LM	FRY	FERRY	M	1990	2.11%	
LM	HGR	HIGHLANDER	M	1992	1.81%	
SI	AS26	SIEGFRIED	M	1971	7.03%	25%
SI	GHS	GRETNA HOUSE SUPERSONIC	M	1986	6.41%	
SI	76STF2	STAR FANNY	F	1976	3.83%	
SI	BKI	BRINKTON BRILLIANT	M	1991	3.66%	
SI	HWE	HEYWOOD ESQUIRE	M	1975	3.64%	

Table 4: List of the top 5 Bulls by breed, that contributed genes to calves born in 2011.

If you talk to a lot of Breeder's, it's the lack of availability of semen of bulls such as the ones on this list that prevents Breeders from continuing to use them, and not the fact that they are convinced that anything better has come along in the meantime. Imagine however if Bulls as good as these and even better were being identified every year? – imagine the progress that a breed could make? – that is what a well organized Breeding Program can deliver.

G€N€ IR€LAND Maternal Bull Breeder Scheme.

It is against this backround that ICBF has launched a new method of sourcing young Beef AI Testbulls – which is now called the G€N€ IR€LAND Maternal Bull Breeder Scheme.

Basically, it is a program through which ICBF will be involved in the purchasing of young Beef Bulls with excellent Maternal Indexes, collecting semen from them and then dispersing this semen into commercial suckler herds. ICBF will then purchase the resulting male progeny and rear them through to slaughter at Tully. The female progeny will be followed through on farm. The semen inventory of the best Testbulls will then be targeted back into selected pedigree herds so as to generate Stockbulls for use in the National herd.

Some more detail on this new program which is replacing the old Tully Pedigree Bull Performance Test system is as follows:

- Pedigree Breeders sign up to the program (€250/annum). They have their data checked by ICBF to ensure that the dates of birth are correct, weight gains are within biological limits and that in general all of the breeding data has been recorded accurately & on time on the farm. ICBF will use a new index called the 'Data Herd Quality Index' (DHQI) to assess each Pedigree herd's data quality. Herd's with excellent DHQI ratings are then qualified as being official 'Bull Breeder' Herds.

- These qualified 'Bull Breeder' Herds will:
  - Have a 'Bull Breeder Stamp' printed on Sales Catalogues & on Bull Searches etc to signify the status of the herd the animal is coming from.
  - Have potential Beef Progeny Test Bulls purchased from them for use in the G€N€ IR€LAND Maternal Progeny Test program.

- The G€N€ IR€LAND Maternal program (which is operated by ICBF in conjunction with Beef Breed Societies, AI Companies & Commercial farmers) will decide which Bulls will be purchased from the Bull Breeder herds. The main criteria for Bull selection will be that large numbers of bulls with excellent Maternal indexes go on test, thus maximizing the chances of a number of top bulls being discovered.

- 1000 straws are collected off each of these progeny test bulls. 500 are stored away and the other 500 are all used to inseminate commercial cows within the G€N€ IR€LAND progeny test herds. A sample of each bull's male progeny are DNA parentage verified, purchased by ICBF and brought through to slaughter at Tully. Meat quality, taste and tenderness tests are also done on the carcasses at this stage. The females are followed through on-farm to assess their milk and fertility.

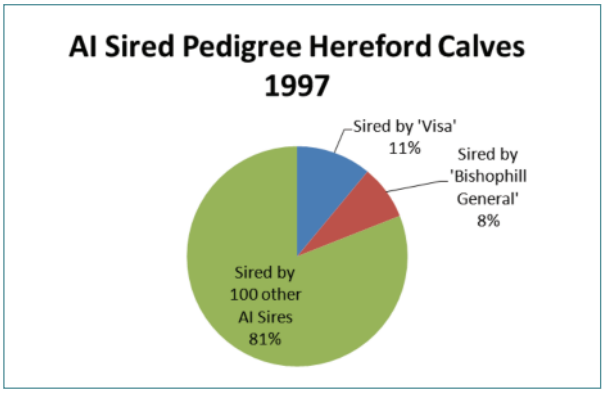
- Following the progeny test – the 500 straws of the top bulls are taken back out of storage & made available to just the qualified 'Bull Breeder' herds.

- A stream of sons of these top bulls will then start to be produced by these 'Bull Breeder' herds and get sold into commercial suckler herds thus starting to spread their desirable genes into the national herd.

- Setting up the Breeding Program in this way means that over time, an increasing amount of the Stockbulls used to sire the majority of calves each year (pie chart 3) will have balanced indexes and we can improve the currently skewed nature of those genetic trendlines seen earlier (Graphs 1 - 8).

The design of this Breeding program will guarantee that large numbers of Beef Testbulls with excellent genetic indexes will get semen taken off them for progeny testing ever year. This automatically increases the chances of identifying bulls with superior genetics.

It is also important to note that these new topbulls will be emerging **every year**, surpassing the bulls from the previous year. Two of the bulls featured earlier – 'Bishophill General' & 'Visa' dominated their breeds for a long time. In 1997 nearly 20% of all AI sired pedigree Hereford calves were sired by one or other of these bulls.



Pie Chart 4: Proportion of AI sired pedigree Hereford calves sired by the AI Bulls 'Visa' & 'Bishophill General' in 1997.

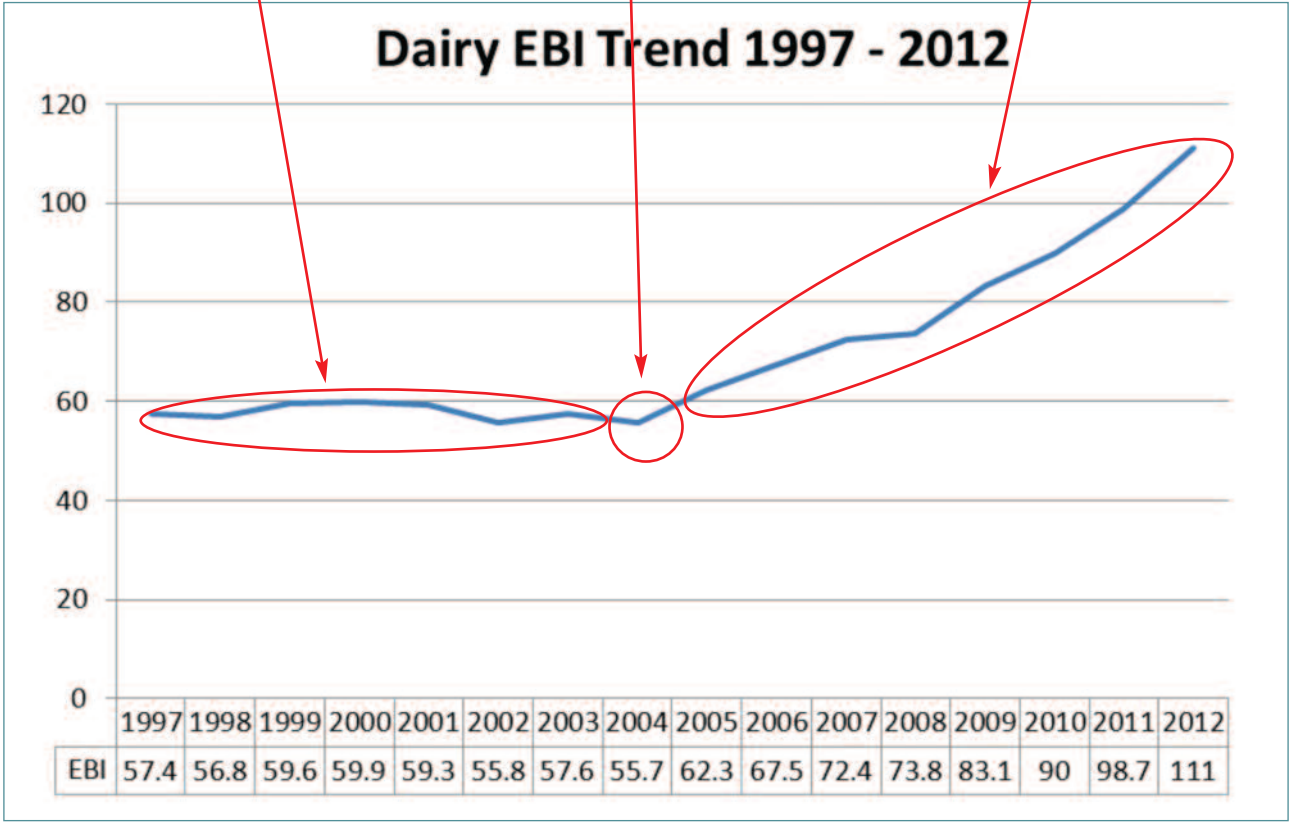
ICBF has already put such a Cattle Breeding program in place for the dairy industry here. In 2004, ICBF,AI Companies, IHFA, pedigree breeders and commercial dairy farmers began working very closely together to establish a new Dairy Breeding Program called G€N€ IR€LAND.

It works on the basis of getting large numbers of young dairy bulls with very high EBI indexes (equivalent of Terminal or Maternal index in beef) purchased by AI Companies. Genomics also plays a part but the basic formula is still the same – by progeny testing large numbers of the 'right' bulls every year then more top bulls start to come through each year than ever before was the case. The genetic trend of the national herd then also starts to automatically lift as the graph below shows:

Very little Genetic Progress being made before the Dairy G€N€ IR€LAND Breeding Program was established.

G€N€ IR€LAND Dairy progeny test program established in 2004

60 High EBI Dairy Progeny Test bulls being selected for Progeny Testing every year causes a large and sustained increase in the genetic merit of the calves being born year after year.



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
EBI	57.4	56.8	59.6	59.9	59.3	55.8	57.6	55.7	62.3	67.5	72.4	73.8	83.1	90	98.7	111

Graph 11: Progress in Genetic Trend for Dairy Herds due to the G€N€ IR€LAND Dairy progeny test program.

Summary

This new Beef Breeding program is not a one or two year project. It will be a permanent part of ICBF's mission statement to '*achieve the greatest possible genetic improvement in the national cattle herd*'.

It is only now that the cattle breeding infrastructure is at a highly developed stage (e.g. Animal Events, AI Handhelds, On-farm Weight Recording) & that National Beef Breeding Indexes have been agreed upon (Maternal & Terminal Indexes) that the timing is right for a comprehensive Beef Breeding Program to be initiated.

It will require several sectors of the cattle breeding industry working very closely together, but this is not seen in any way as an obstacle but more as an advantage, given how closely these same organisations and others currently work together on a daily basis – such is the nature, thankfully, of the Irish Cattle Breeding Industry in 2013.

It will take time for this program to develop whereby its full effects are being felt on a National level (National Average Calving Interval figures improving etc) but the benefits that will accrue from this program will be cumulative and permanent. ICBF looks forward to working closely with its member organisations and various industry partners to help deliver a world class Beef Breeding program for Ireland.