

IRISH CATTLE BREEDING FEDERATION

The Genetic and Productivity Gains Achieved by the Irish Cattle Industry through a Central Data Platform.



Dr Andrew Cromie, Technical Director, ICBF & Chairman Interbeef.



Overview of Talk.

- · Irish Cattle Herd.
- · Establishing a Central Data Platform.
- · Achieving Genetic Gain.
- Achieving Productivity Gain.
- Current priority areas.
- Discussion.



1. Irish Beef Cattle Herd.



- 1m beef cows & 1.5m dairy cows.
- 500k tonnes beef/year.
 - 55% suckler beef & 45% dairy beef.
 - Steers & heifers.
 - 80% exported.
 - Seasonal system (370kg @28 mths). Grass-fed!
- Cross-bred beef cow herd.
 Main breeds LM, AA, CH, HE &
 SI. AA has grown rapidly in last 5 years.



2. Central Data Platform.

- Key principles => outcomes;
 - Common goal/vision => profitability.
 - Sharing of data => remove duplication.
 - Principle of ownership and access => data moves with the animal. Owner controls.
 - User services => clear agreements.
 - Data available for R&D => genetic evals.
- Achieving above is not easy (!) => new entity, e.g., ICBF, Datagene in Aus.....



Irish Cattle Breeding Federation.

- · Established in 2000 as a co-op of 30 cattle breeding orgs.
 - Farm orgs, AI comps, milk recording co-ops, herdbooks (shareholders) + DAFM.
- Operating budget of ~€7m/year.
 - 50% "industry good" (govt & tag) & 50% "service income" (industry & herdplus).
 - An important balance between short and long term requirements (cattle breeding programs must be viewed as min 10 year investments).
- Based in Cork, staff of $70 \Rightarrow 100k$ farmers.



Sounds Easy. It wasn't always like that!



A new breeding broom

WE should welcome Brian Wickham to Ireland as the chief executive of the New Cattle Breeding Authority.

He faces challenges on a number of fronts. The most basic is how the new legislation is to be interpreted governing the issue of new licences - both to those who only wish to sell and distribute semen in the country as well as to those providing a full AI service in the field.

A balance between sensible availability of good foreign bull semen will have to be matched with the necessity of having adequate progeny testing under Irish conditions.

He then must tackle the breeding issues themselves.

On the dairy side there will be a necessity to work in with Moorepark on the fertility difficulties associated with the high RBI cows - but in his column on page 15 Paddy O'Keeffe strongly suggests that the problem may be as much closely associated with husbandry as with breeding. On the beef side the scene is chaotic with too many breeds coupled with a lack of measurement of performance leading to poor bulls being used. The cost to farmer profitability is enormous: Dr Wickham faces a major task.

Irish Farmers' Journal, March 7, 1998

The challenge of data sharing.

1998

Page 18 Irish Farmers' Journal

March 6, 1999

Pedigree News

Breed societies and ICBF clash over Herdbook

By John Shirley

"Under these circumstances, we

partaking in ICBF when acceptable

2000

Should we join ICBR

John Shirley

Should we as a minority breed join the Irish Cattle Breeding Federation (ICBF)?, asked the lady on the phone.

This prompted another question; What stage is ICBF at?

ln short it now has responsibility for all dairy and beef recording activity in

Movement is evident in dairy breeding in the form of four times yearly dairy bull

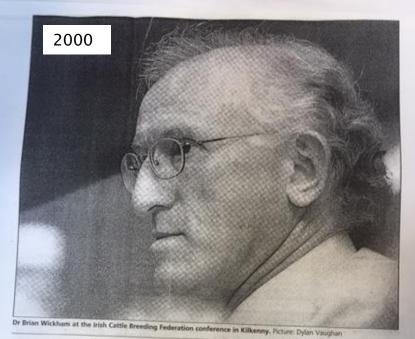
titude to ICBF is planned for march 10 next. Even if the PCBC recommends joining with ICBF, individual breeds

reservations about the shareholding of ICBF being split 46 per cent for farm organisations and 54 per cent between the other three constituent parts.

· For the moment ICBF seems to have adequate cash flow to operate but the breed societies will be expected to make a significant capital

meeting to discuss their atmay still not get on board.

The PCBC still has



Controversial ICBF move to give data to meat factories

Maeve Dineen

* THE extensive Irish Cattle Breeding Federation database could soon be made available to beef processors as a means of predicting the number and quality of cattle coming on stream. Details of the con-



lot easier for people in the industry to source specific stock, such as live traders looking for breeding heifers. It would simply make the whole cattle breeding industry more efficient."

Under a new decoupled

ICBF established in 2000. The challenges weren't over but we made progress.

2002 Page 8 Irish Farmers Journal Testing times for cattle breeding boss

THE Irish Holstein Friesian Association last week passed a vote of no-confidence in Brian Wickham, chief executive of the Irich Cattle Breading Enderation Dat O'Ventile examiner the background

2003

Slow burner ICBF about to shed light on beef



the area of cattle procure ment for the processing in-dustry. This is the brainchild of their new beef specialist Nicholas Grubb.

With decoupling in the air,

Quotes from the conference

vious of the progress ICBF has made in its first five

BRIAN Wickham confidence "cambeen every indica

Wha ICBF

THE ICEF is the st body responsible breeding in Irelan

every tag. Al com and milk recording ovided by ICBF.

The cattle breed annations in colla centralised database 2010

66 ICBF has revolutionised cattle breeding and it is still driving development hard 99



equally strong detractors. The this year. All the time the index emphasis on cow fertility, a ICBF discussion document envisuees more revolutionary in the ICBF 'empire'.

To appreciate just how much structural change has occurred over the past dozen years we need to go back to pre-ICBF down Reform ICRF came on the

reliability was listed at 99pc. Farmers, who like absolutes, change and further expansion are not impressed with such drastic fluctuations.

> deliver faster rates of genetic gain. After a long gestation, farm organisations. Al

trend that is now being followed by the rest of the cattle breeding world. Along with the industry ICBF promoted initia- an ICBF discussion document ICEF was born out of a need tives on hand held computers to just released. This document to bring further order and to AI technicians and DIY milk envisages ICBF getting more

However, relations between

tion of one sort or another.

The drive for more selffinancing is probably behind some amazing suggestions in involved in commercial Al.

Incredibly, in the light of the ICBF and Al/milk recording hard won self-financed ratio-

`Challenges are still there, but have moved to delivering genetic gain.



Useless pedigree bulls costing farmers millions

Ready for the parlour

PAUL MOCHEY NEWS CORRESPONDENT

EXCLUSIVE

Madeofing rises on pedigron balls to coving stellier formers up to titles every year.

stray year.

This is the finding of an investigation into bell performance by the Atta Formers diserted. Some breeders are manipulating than on the log materials make of externa-

Importions under the Germ Industry bed breading programme identified ESE pedigree rows on which Corothess user our ried out. But over holf of those Corothess were not declared by the breading herd owners.

Further, in a quarter of those raises, the brancher dained that the raising this "unassisted".
Worryingly the breeders within this elice programme are consid-

ered to be the country's most progressive.

HUSTLE

%Continued on page &



Scale in itself is not an answer if a business is not making money

INTERVIEW WITH GLAMBIA CHAIR HENRY CORBALLY IS 16-17





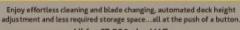
DEALER >> 10

fore Moloney and his son fore Undescribing come before militing at Burgery, Quegarvan, Co Materford. The hard comists of 140 Hostein cows that are currently producing 26 litres at 3,85% butterfat and 3,30% protein on 1,5kg of meal and grazed grass.

H HUSTLER

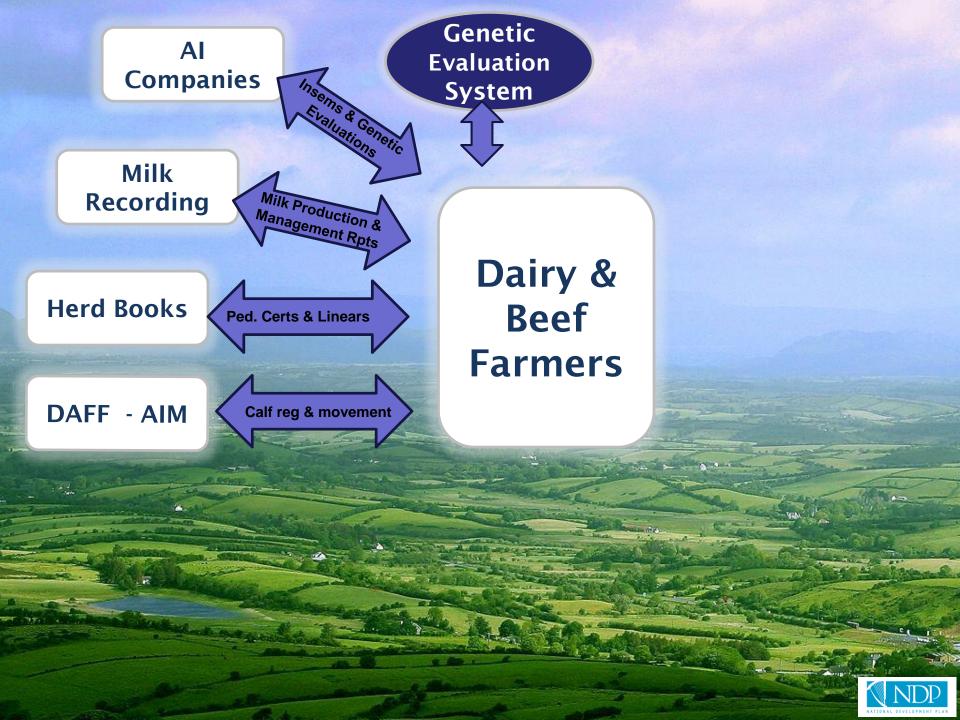
- A new "breeding paradigm" has been created => €uro-Star indexes are now the key determinant for bull purchase. Not Visual.
- Huge challenge for bull breeders and herdbooks.
 - Less than half the herds are involved in whole herd performance recording (remember comment earlier!)
- The best are responding.

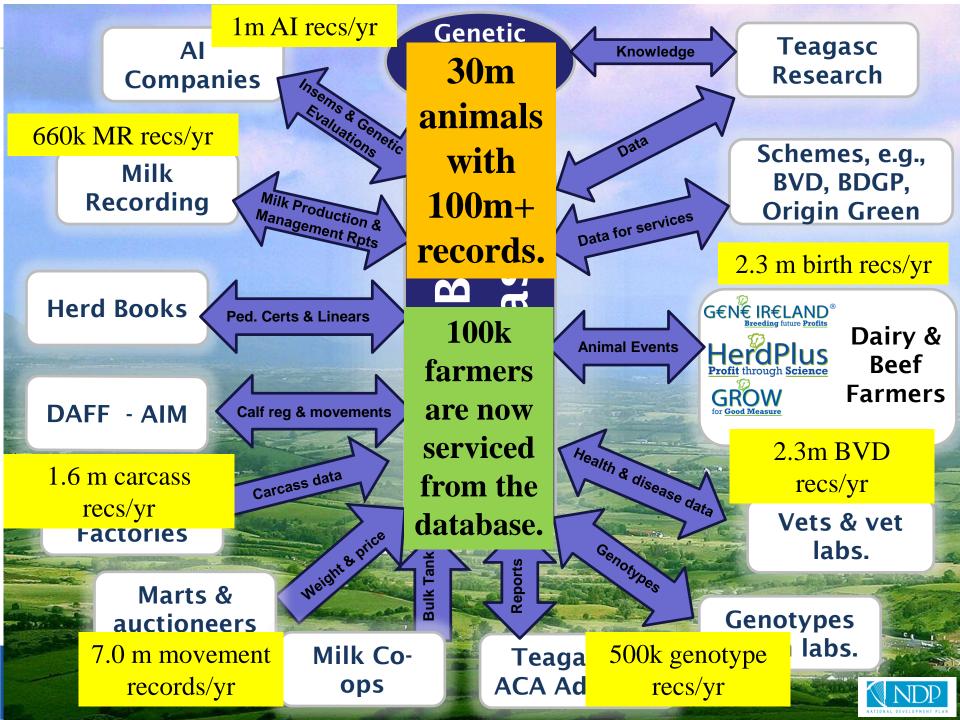
THE BRAND NEW HUSTLER RAPTOR FLIP UP











3. Genetic Gain.

- · Profit from science approach (with Teagasc).
- · Evaluations have evolved with available data;
 - 2002 Within breed pedigree only.
 - 2005 Multibreed & cross-bred.
 - 2008 Profit indexes (overall)
 - 2012 Profit indexes (rep and terminal).
 - 2015 Integrating genomics.
- Weekly genomic evals for 40m animals.
 - 10m calv, 7m carc, 1m geno & 100k foreign EBV's
- Incentive programs focused on data quality.



€uro-Star Indexes.

€uro-star Index	eplacement Graphics	Terminal Graphics	Linear Type	Pedigree	Prev Eval	Geno Eval	
Star Rating (within Limousin breed) Economic Indexes		(es	€uro value	e Index	reliability	Star Rating (across all beef l	breeds)
****	Replacement (pe	placement (per daughter lactation)		€80 47% (****	ľ
****	Terminal		€152	49% ((Average)	****	r

- · Profit Index, e.g., €80 more per calving.
 - Multi-breed evaluations.
- Star system; 5 star versus 1 star.
 - Across all breeds, including commercial.
- Two main profit indexes; (i) Replacement female and (ii) Terminal.



€uro-Star Replacement Index.

Trait	Goal	Relative wt
Calving	Less	16%
Feed Intake	Less	18%
Carcass wt (for age)	More	21%
Maternal milk	More	18%
Female fertility	More	23%
Docility	More	4%

 The ideal Irish beef cow; A weaned calf every year of good weight & quality.

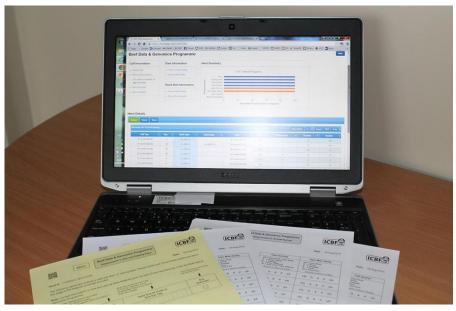


ICBF Spring Active Beef Bull List 2018

Bull Details			Re	epla	eplacement			Calving		Milk		Semen			
Rank	Code	Bull Name	Breed	Gene reland	Index	Rel %	Stars Within	Stars Across	Calv Diff %	Rel %	Calv Recs	Daughter Milk (kgs)	Rel %	Price	Supplier
1	SA4059	Beguin	SA	No	€252	59	5	5	1.6	83	121	15.8	72	€26	Munster,PG
2	SA2189	Ulsan	SA	No	€203	63	5	5	1	96	780	11.7	73	€10	Dovea
3	SI4383	Derreen Declan	SI	No	€192	54	5	5	3.2	74	69	12	49	€12	Dunmasc
4	ZAG	Castleview Gazelle	LM	Yes	€191	77	5	5	4.4	99	27072	0.9	76	€10	Munster,PG
5	SFL	Du Stordeur Flaneur	BB	No	€183	96	5	5	5.1	99	10244	4.4	99	€15	Bova
	VTA	Vaillant	SA	No	€179	77	5	5	2.1	93	300	6.2	85	€14	Bova
7	ISL	Islavale Cracker 11	SI	No	€171	76	5	5	7.2	97	1148	8.6	86	€10	Dovea
8	SI2469	Lisnacrann Fifty Cent	SI	Yes	€170	57	. D		_£ I			Т	D I		Munster,PG
9	SA2153	Highfield Odran	SA	Yes	€166	54		_				n Top	Bui	ı	Munster,PG
10	QCD	Cloondroon Calling	SI	Yes	€161	82	L	isting	y =>	Fo	cused	don			Dovea
11	SA4060	Baron	SA	No	€161	50		-	•			ulls wi	thi	n	Munster,PG
12	JSS	Usse	LM	No	€160	52	•		_				CIII	''	Eurogene
13	SI2152	Curaheen Earp	SI	Yes	€159	59	τ	he re	ievai	nt r	reed	S.			Munster,PG
14	VMO	Voimo	СН	No	€159	64								Munster,PG	
15	CH2218	Bivouac	СН	No	€155	59	=	> wh	v IČ	ΔR	and I	nterbe	ef		Dovea
16	XCD	Clonagh Direct Debit	SI	No	€155	60							.		Dunmasc
17	GEU	Gordon Et Du Golard	ВВ	No	€155	77	d		•			reland.			Munster,PG
18	SI4030	Auchorachan Wizard	SI	No	€153	54		• C	H da	ata	now	shared	fro	om	Eurogene
19	TSO	Curaheen Tyson (Et)	SI	No	€150	89		U	K Rr	eec	Inlan	=> Nev	۸/ t	on	Celtic Sires
20	LZR	Lataster Eric	SA	No	€150	92					•				Munster,PG
21	SI2099	Kilbride Farm Escalop 13	SI	No	€149	51						nis) on	IVId	.у	Bova
22	ZLL	Lanigan Red Deep Canyon Et	AA	No	€146	78		2	018	list	ing.				Bova
23	KYA	Cornamuckla Lord Hardy K222	AA	No	€145	95	5	5	0.8	99	39775	3.6	98	€10	Munster,PG
24	ZEP	Hawkley Red Zeppelin N659	AA	No	€143	50	5	5	2.1	91	380	5.3	38	€10	Dovea
25	PZB	Bonaparte	SA	No	€142	81	3	5	3	97	1284	1.1	90	€10	Munster,PG
26		Drumlegagh Dennis	SA	No	€141	64	3	5	3.2	87	244	6.3	68		Eurogene
27	AHC	Auroch Deuter Pp	SI	Yes	€140	61	5	5	5.4	96	827	9.5	44	€10	Munster,PG
	YFK	Kilbride Farm Delboy 12	SI	No	€138	64	5	5	10.6	96	805	9.7	58		Eurogene
29	ОКН	Keltic Handsome	LM	Yes	€138	66	5	5	6.1	99	4322	1.5	54	€12	Munster,PG
30	SI4083	Clonagh Frosty King Et g Federation Soc Ltd 2013	SI	Yes	€137	50	4	5	4.1	65	36	12.2	50	€10	Munster,PG

Large focus on farmer recording.

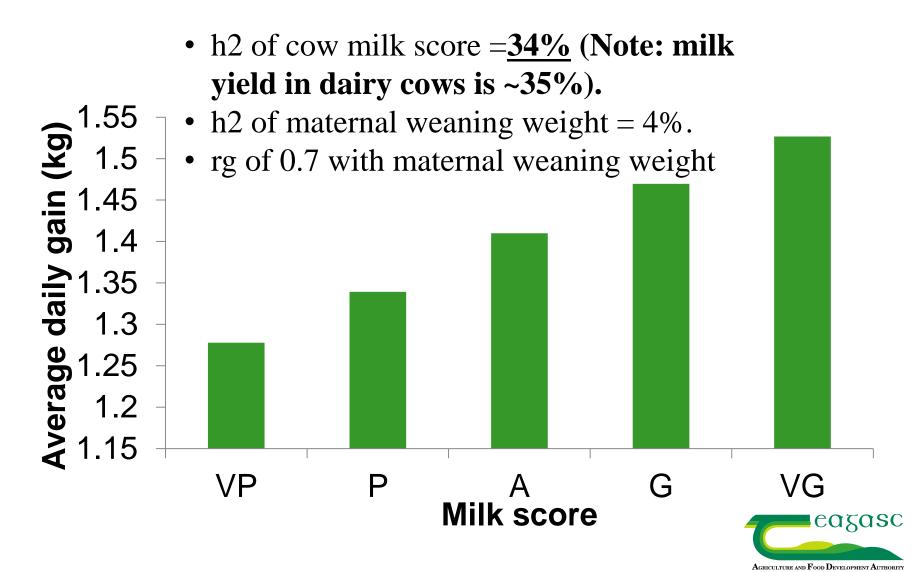




- · Farmers must record data regularly for key events;
 - Calving, cow milk score, cow docility, calf quality, calf docility, scour, pneumonia, bull functionality, bull culling reasons....
- · Paper based and electronic recording.
- · Can farmers record data accurately?



Growth rate of weanlings per milk score (Twomey, 2018).



Do the indexes work – Terminal Trails Putting my bulls on the line



	Age	Weight	Conform	Price/kg
5 Star	663	364	10.3 (U-)	€4.50
4 Star	717	372	10.2	€4.44
Average	780	359	9.7 (R+)	€4.39
2 Star	812	345	8.7	€4.33
1 Star	842	313	6.1 (O+)	€4.13



Do the indexes work? Female Traits.

1									
Star Rating	No. Animals	Replacement Index/parity	Lifetime CO2e*	AFC (days)	CIV (days)	Cow Wt (kg)	Wean Wt (kg)	Progeny Carc Wt (kg)	Progeny Carc Age (days)
5 Star	2,183	€130	17,085	860	375	664	311	374	604
4 Star	1,881	€87	17,260	862	376	672	305	373	606
3 Star	1,984	€58	17,378	881	377	684	299	370	605
2 Star	120	€31	17,484	887	377	689	296	364	605
1 Star	724	-€6	17,635	896	383	737	285	361	610
Diff 1 v 5 star		€136	-550	36	8	73	26	13	-6
Pvalue				***	*	***	***	***	NS
					1				

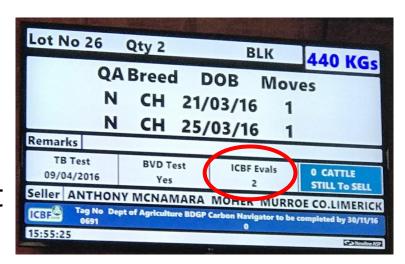
^{*} Based on Gross Emissions Output over the cows lifetime. Includes emissions from the cow and her progeny.

- Commercial females, cross-bred, indexes from female as a weanling. Compared to 1 star cows, 5 stars are;
 - More profitable, sustainable & carbon efficient (+€136/cow).
 - Suckler cow efficiency => 46.8% for 5 stars vs 38.6% for 1 stars.
- Having this data consolidated allowed Ireland make case re: EU supported beef genomics scheme.



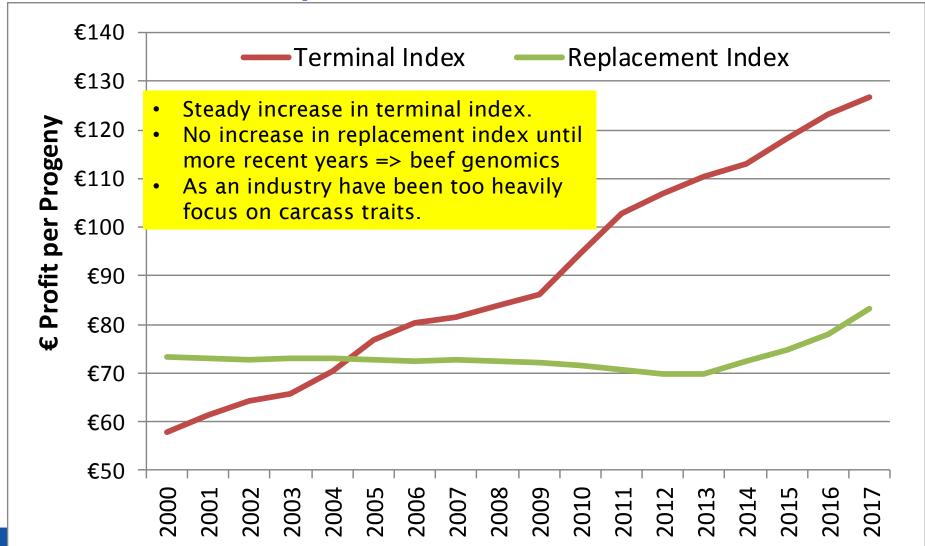
Irish Beef Data & Genomics Program.

- · More profitable, sustainable & carbon efficient cows.
- €300m total funding 6 years (2015-2020).
 - Farmers paid ~€90/cow/year to complete key actions re: the scheme, e.g., data recording, genotyping, targets for 4/5 star cows & bulls. Note: they only receive the payment on successful completion of the action; Carrot and Stick approach!
- 24k farms & 600k cows.
- ~1.2m animals genotyped todate. Cost of genomic service is €22/animal.
- · Other countries now looking at similar approaches.

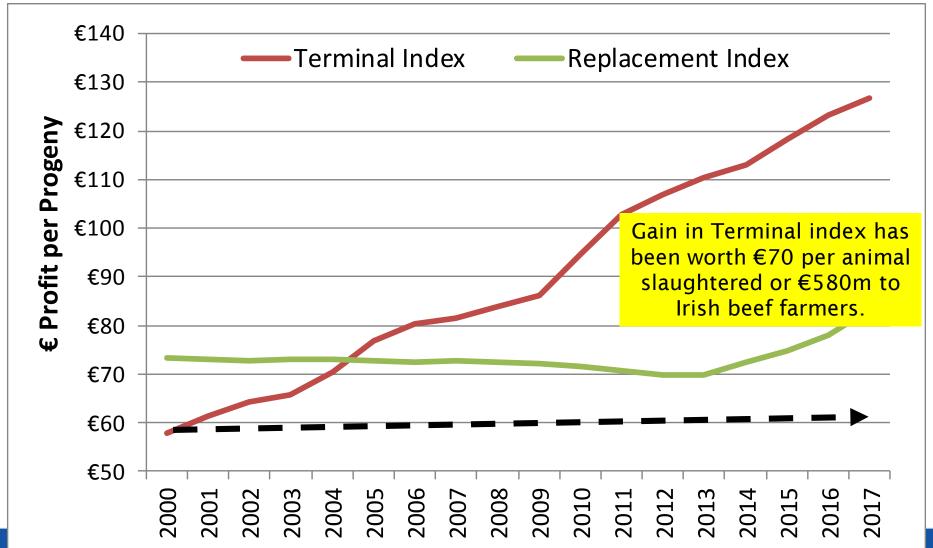




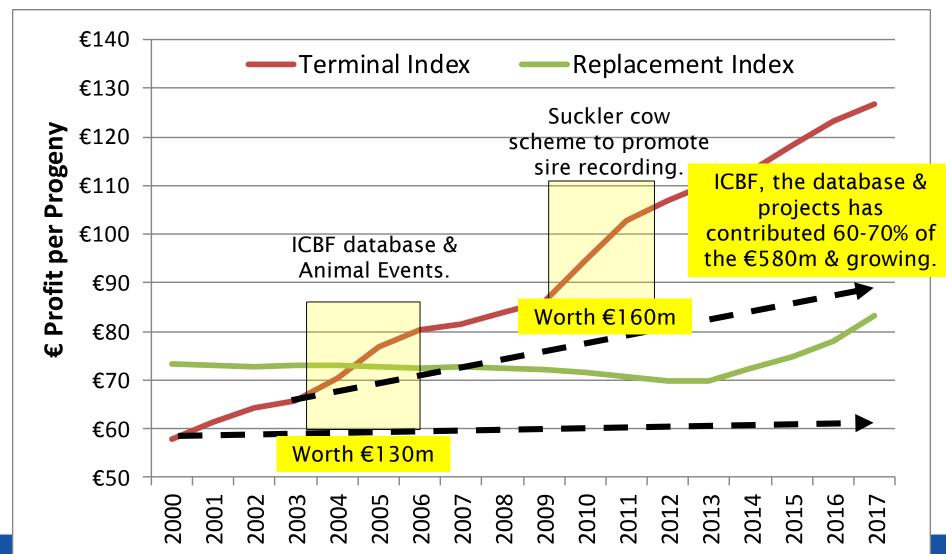
Genetic Gain for Terminal & Replacement Index.



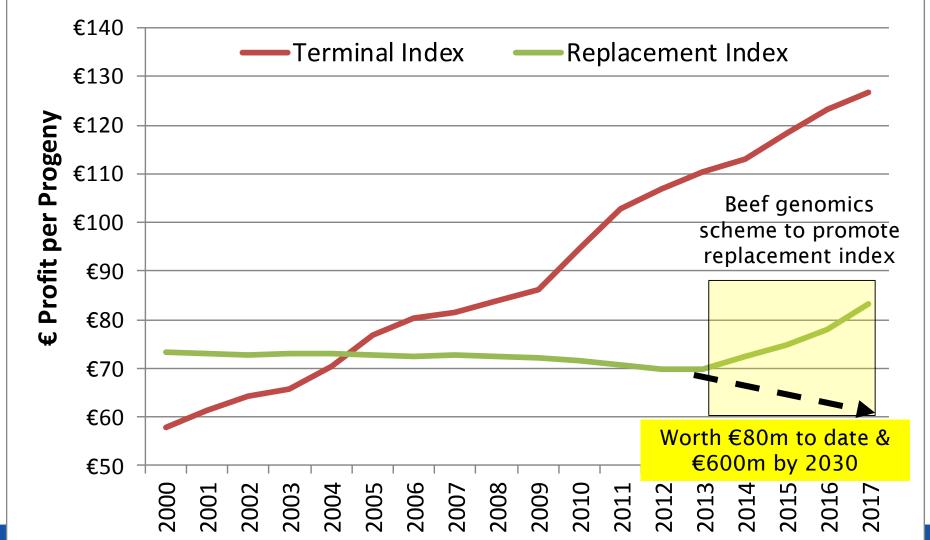
Value of Genetic Gain for Terminal Index



The Value of ICBF & Govt/Industry Supported Programs - Terminal Index.



The Value of Govt/Industry supported Programs - Rep Index.



4. Productivity Gains.

- Close collaboration with industry re: "user pays" benchmark reports & services (ICBF HerdPlus).
 - 30k farmers participating (20k are beef).
 - €60/herd/year.
- Focused on productivity, with a strong emphasis on genetic gain.
- Critical link with Teagasc extension programs.



Example; Beef Output.



Beef Output Report

01/01/2016 - 31/12/2016

Herd Owner: HEINZ EGGERT Herd Number: 11131065 Page: 1 (3)

1. Summary Data

Report calculates how much liveweight was produced from this herd in the selected year. It then breaks this figure down into various KPI's which are detailed in section 2 below. All weights are liveweights.

A. Total Beef Output (Kgs)

Sales - Purchases + Inventory Change, in the selected year 63,333

B. Total Livestock Units (LU)

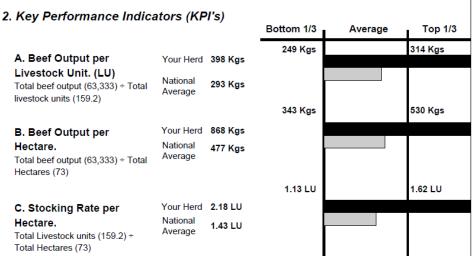
Average livestock units in the herd, in the selected year.

159.2

C. Total Hectares (Ha)

73

Total hectares available to the cattle enterprise, in the selected year.





Beef Output Report

01/01/2016 - 31/12/2016

Herd Owner: HEINZ EGGERT Herd Number: 11131065 Page: 2 (3)

3. Sales

This section gives a breakdown of the stock which was sold from this herd in the selected year.

Animal Type	Number of Animals	Avg. Weight (Kgs)	Total Liveweight Sold (Kgs)*
Suckler Cows	29	706	20,486
Stock Bulls	0	0	0
0-6 Months Male	0	0	0
0-6 Months Female	0	0	0
6-12 Months Male	0	0	0
6-12 Months Female	0	0	0
1-2 Yrs Male	46	708	32,563
1-2 Yrs Female	13	508	6,604
2+ Yrs Male	0	0	0
2+ Yrs Female	0	0	0
Total Sales	88		59,653

4. Purchases

This section gives a breakdown of the stock which was purchased into this herd in the selected year.

Animal Type	Number of Animals	Avg. Weight (Kgs)	Total Liveweight Purchased (Kgs)*
Suckler Cows	0	0	0
Stock Bulls	0	0	0
0-6 Months Male	0	0	0
0-6 Months Female	0	0	0
6-12 Months Male	0	0	0
6-12 Months Female	0	0	0
1-2 Yrs Male	0	0	0
1-2 Yrs Female	0	0	0
2+ Yrs Male	0	0	0
2+ Yrs Female	0	0	0
Total Purchases	0		0

Productivity gains; Cow Traits*

Key Metrics	2014	2015	2016	2017
Calving Interval (days)	407	399	391	393
Calves per cow per year	0.80	0.84	0.85	0.87
Age at first calving	31.3	31.1	30.6	30.0
% heifers calved at 22-26 months	17.2	19.2	21.2	25.8
Average parity	4.3	4.4	4.5	4.5
% Dead at birth	1.0	1.2	1.5	1.3
% Dead at 28 days	2.2	2.6	3.4	2.7
% calvings with recorded sire	78.3	80.7	92.8	89.2
% calvings with recorded AI sire	25.4	26.3	28.3	28.6
% calving with calving score data	80.7	83.2	95.9	92.7
% cows culled	18.4	16.3	16	16.8

^{*} Based on data from 24k BDGP herds.



Productivity Gains; Slaughter Traits.

Table 1. Trends in slaughter performance for Beef * Beef Animals.

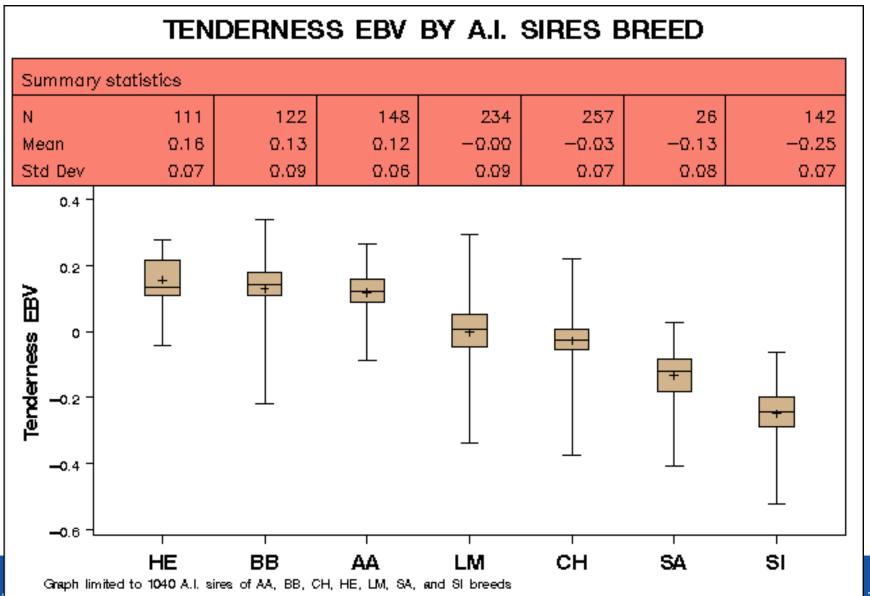
Gender * Typ	e Records	Cwt kg	Age Slau	Conf Score	Fat Class
HEIFER					
2013	242,773	313.5	787.6	8.2	8.7
2014	271,711	323.3	804.8	8.3	9.0
2015	Carcass gain	330.6	800.0	8.5	9.2
2016	per day has	333.4	786.3	8.5	9.0
2017	moved from	332.8	789.3	8.4	9.0
HEIFER Total	0.40 to 0.42 for heifers	326.7	793.6	8.4	9.0
STEER	and 0.42 to				
2013	0.45 for	379.1	874.7	8.3	8.1
2014	steers.	380.6	899.5	8.2	8.3
2015	281,645	388.4	879.2	8.4	8.5
2016	268,683	387.2	859.9	8.3	8.2
2017	269,502	386.3	852.9	8.2	8.2
STEER Total	1,305,937	384.3	873.2	8.3	8.3

5. Current Priority Projects.

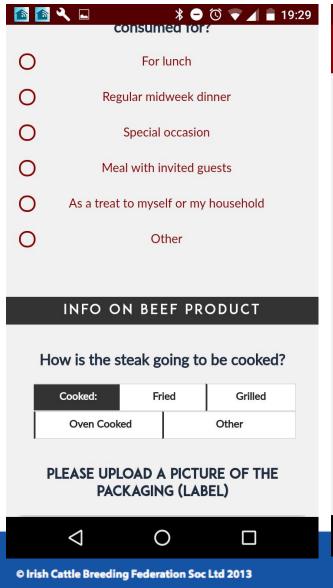
- G€N€ IR€LAND => increase genetic gain in beef.
 - The importance of international collaboration (ICAR, Interbeef) => elite foreign sires for the breeding program.
- · Carcass and meat eating quality traits.
 - Industry funded project (genomics, VIA, cut data, sensory...)
- GHG => cow size/live-weight (cow efficiency).
 - New project looking cow eff & validation of 5 star cow perf
- Genome Editing => Now considered not GMO.
 - New project looking at polledness in dairy and beef.
- Dairy beef => rapid growth in Irish dairy herd.
- DNA based Calf Registration.



Genomics for Meat Eating Quality.



Project; MEQ & Consumers.





- App developed to collect relevant meat eating quality data directly from consumers.
- Initial field trial/validation work under way.

Summary.

- Establishing a common data platform has had a major impact on profitability of Irish beef herd.
 - €70 per animal slaughtered over 15 years => €580m. €25 per female calved after only 4 years => €80m.
 - Connecting existing datasets but also creating new datasets (in terms of farmer recorded traits) has been key.
- · Creating a new entity (ICBF) to manage the platform has also been crucial.
 - 60-70% of total productivity gain directly attributable.
 - Oversight and capacity to deliver change programs e.g., multi-breed evaluations & beef genomics scheme.
- · International collaboration continues to be a major priority for Ireland and ICBF (e.g., IRE & AUS).



Final Thoughts.

- There are challenges with establishing central data platforms and structures.
- Its hard work. It requires leadership from stakeholders who are prepared to operate for a broader industry good (the profitability of farmers).
- ICBF is a working example that it can work and that as a consequence, the future profitability of Irish beef farmers is in a much better place.
- Can you say the same for Australian beef farmers? If the answer is, "I'm not sure", then I urge you to be involved in the discussions that will take place over the coming months regarding data sharing. It will benefit you and your industry in the longer term.







Our Farmer & Government Representation







Our AI & Milk Recording Organisations









Our Herdbooks



Irish Charolais
Cattle Society

























AYRSHIRES*

CATTLE SOCIETY OF GREAT BRITAIN AND IRELAND















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